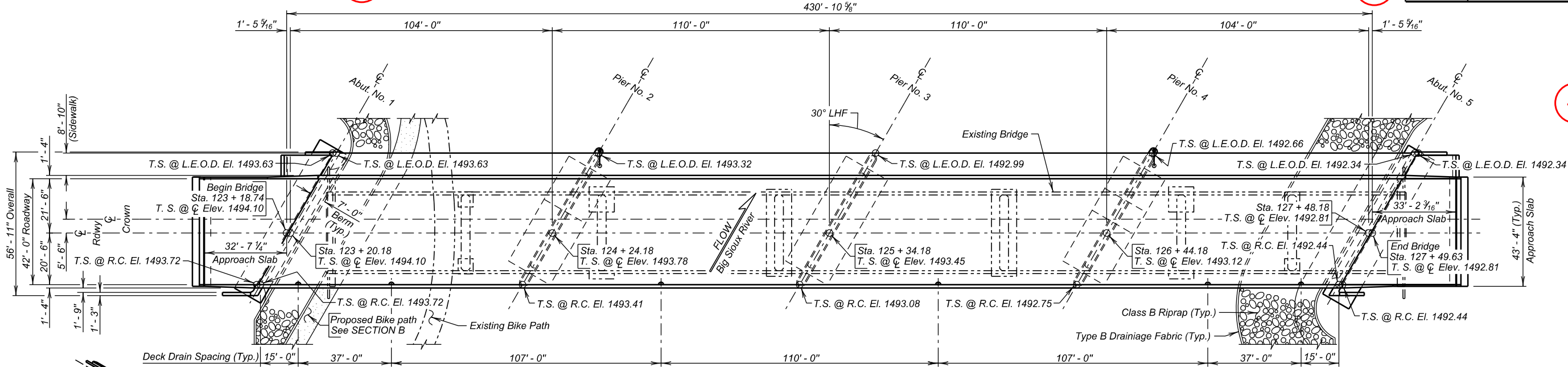


The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			



PLAN
(Sidewalk Railing not shown)

NOTES:
T.S. at C El. = Top of Slab at Centerline Elevation
T.S. at R.C. El. = Top of Slab at Right Curb Elevation
T.S. at L.E.O.D. El. = Top of Slab at Left Edge of Deck Elevation

- X081- INDEX OF BRIDGE SHEETS -**
- Sheet No. 1 - General Drawing
 - Sheet No. 2 - Estimate of Structure Quantities and Notes
 - Sheet No. 3 - Notes (Continued)
 - Sheet No. 4 - Notes (Continued)
 - Sheet No. 5 - Notes (Continued)
 - Sheet No. 6 - Notes (Continued)
 - Sheet No. 7 - Subsurface Investigation
 - Sheet No. 8 - Drill Location, Footing and Rock Dowel Layout
 - Sheet No. 9 - Subsurface Investigation Cross Sections
 - Sheet No. 10 - Abutment No. 1 Details (A)
 - Sheet No. 11 - Abutment No. 1 Details (B)
 - Sheet No. 12 - Abutment No. 1 Details (C)
 - Sheet No. 13 - Abutment No. 5 Details (A)
 - Sheet No. 14 - Abutment No. 5 Details (B)
 - Sheet No. 15 - Abutment No. 5 Details (C)
 - Sheet No. 16 - Pier No. 2 Details (A)
 - Sheet No. 17 - Pier No. 2 Details (B)
 - Sheet No. 18 - Pier No. 2 Details (C)
 - Sheet No. 19 - Pier No. 3 Details (A)
 - Sheet No. 20 - Pier No. 3 Details (B)
 - Sheet No. 21 - Pier No. 3 Details (C)
 - Sheet No. 22 - Pier No. 4 Details (A)
 - Sheet No. 23 - Pier No. 4 Details (B)
 - Sheet No. 24 - Pier No. 4 Details (C)
 - Sheet No. 25 - Superstructure Details (A)
 - Sheet No. 26 - Superstructure Details (B)
 - Sheet No. 27 - Barrier Curb & Deck Drain Details
 - Sheet No. 28 - Barrier Curb Railing Details
 - Sheet No. 29 - Sidewalk Railing with Chain Link Fence Details
 - Sheet No. 30 - 103' - 9" Girder Details

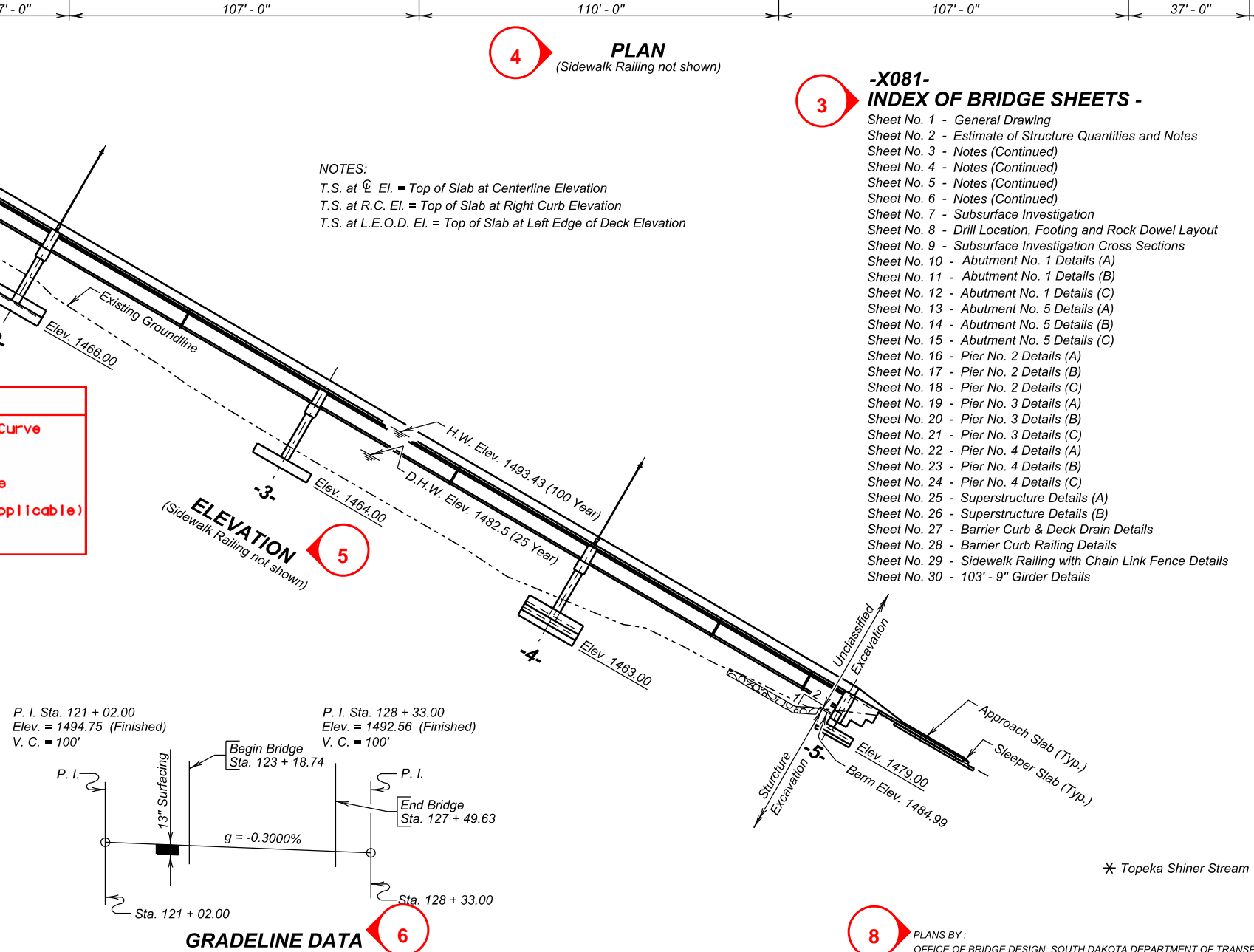
- X081- INDEX OF BRIDGE SHEETS CONT. -**
- Sheet No. 31 - 109' - 3" Girder Details
 - Sheet No. 32 - Erection Data and Slab Form Elevations (A)
 - Sheet No. 33 - Erection Data and Slab Form Elevations (B)
 - Sheet No. 34 - Diaphragm Details
 - Sheet No. 35 - Details of Bridge End Backfill Adjacent to Abut. No. 1 (A)
 - Sheet No. 36 - Details of Bridge End Backfill Adjacent to Abut. No. 1 (B)
 - Sheet No. 37 - Details of Bridge End Backfill Adjacent to Abut. No. 5(A)
 - Sheet No. 38 - Details of Bridge End Backfill Adjacent to Abut. No. 5(B)
 - Sheet No. 39 - Riprap Details
 - Sheet No. 40 - Approach Slab Adjacent to Bridge Details (A)
 - Sheet No. 41 - Approach Slab Adjacent to Bridge Details (B)
 - Sheet No. 42 - Tapered Barrier Details (A)
 - Sheet No. 43 - Tapered Barrier Details (B)
 - Sheet No. 44 - Sidewalk Approach Slab Details
 - Sheet No. 45 - Approach Slab Joint Details (A)
 - Sheet No. 46 - Approach Slab Joint Details (B)
 - Sheet No. 47 - As-Built Elevation Survey (A)
 - Sheet No. 48 - As-Built Elevation Survey (B)
 - Sheet No. 49 - Standard Plate No's. 460.02 and 460.05
 - Sheet No. 50 - Standard Plate No's. 620.19

- REQUIRED LIST**
- 1 Title Block
 - 2 Project Block
 - 3 Index of Bridge Sheets
 - 4 Plan View
 - 5 Elevation View
 - 6 Horizontal/Vertical Curve
 - 7 Survey Datum Box
 - 8 Design Firm or Office
 - 9 Hydraulic Data (if applicable)
 - 10 North Arrow

HYDRAULIC DATA

Q_d	13853 cfs
A_d	3552 sq. ft.
V_d	3.9 fps
Q_F	13853 cfs
Q_{100}	33240 cfs
Q_{OT}	33250 cfs
V_{max}	6.2 fps

Q_d = Design discharge for the proposed bridge based on 25 year frequency. El. 1482.5.
 Q_{OT} = Overtopping discharge and frequency 100 year recurrence interval. El. 1493.18. Location: Sta. 128 + 00.00 (left curb).
 Q_F = Designated peak discharge for the basin approaching proposed project based on 25 year frequency.
 Q_{100} = Computed discharge for the basin approaching proposed project based on 100 year frequency. El. 1493.43.
 V_{max} = Maximum computed outlet velocity for the proposed bridge, based on 100 year frequency.



GRADELINE DATA

GENERAL DRAWING
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
* OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93
PCN 03RT
MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016
-X081-
DESIGNED BY BB CK. DES. BY TD DRAFTED BY MG
Steve A. Johnson
BRIDGE ENGINEER

PLANS BY:
OFFICE OF BRIDGE DESIGN, SOUTH DAKOTA DEPARTMENT OF TRANSPORTATION

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ESTIMATE OF STRUCTURE QUANTITIES

DESCRIPTION	QUANTITY	UNIT	REMARKS
Bridge Elevation Survey	Lump Sum	LS	
Concrete Penetrating Sealer	2417.2	SqYd	See Special Provision
Incidental Work, Structure	Lump Sum	LS	
Base Course	3278.6	Ton	
Structural Steel, Miscellaneous	Lump Sum	LS	
Membrane Sealant Expansion Joint	104	Ft	
Structure Excavation, Bridge	1541	Cu Yd	
Bridge End Embankment	1215	Cu Yd	
Granular Bridge End Backfill	145.6	Cu Yd	
Class A45 Concrete, Bridge Deck	809.0	Cu Yd	
Class A45 Concrete, Bridge	837.3	Cu Yd	
Concrete Approach Slab for Bridge	325.0	Sq Yd	
Concrete Approach Sleeper Slab for Bridge	69.9	Sq Yd	
Install Dowel in Concrete	648	Ea.	
Install Dowel in Rock	277.5	Ft	
Deck Drain, Girder Bridge	6	Ea.	
Controlled Density Fill	9.3	Cu Yd	
Steel Pedestrian Railing on Sidewalk	452.7	Ft	
Steel Pedestrian Railing on Concrete Barrier	429.0	Ft	
Reinforcing Steel	145060.0	Lb	
Epoxy Coated Reinforcing Steel	179694.0	Lb	
No. 4 Rebar Splice	14	Ea.	
No. 7 Rebar Splice	112	Ea.	
54" Minnesota Shape Prestressed Concrete Beam	2982	Ft	
Chain Link Fence for Bridge Sidewalk	453	Ft	
6" reinforced Concrete Sidewalk	302	Sq Ft	
4" Underdrain Pipe	213	Ft	
Porous Backfill	32.6	Ton	
Class B Riprap	850.8	Ton	
Type B Drainage Fabric	1073	Sq Yd	
Geogrid Reinforcement	1640	Sq Yd	
Waterproofing Membrane for Structure	248	Sq Ft	

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SPECIFICATIONS FOR BRIDGE

- Design Specifications: AASHTO LRFD Bridge Design Specifications, 2014 Edition with 2015 and 2016 interims.
- Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and required provisions, supplemental specifications, and special provisions as included in the proposal.

BRIDGE DESIGN LOADING

- AASHTO HL-93.
- Dead Load includes 22 psf for future wearing surface on the roadway.

DESIGN MATERIAL STRENGTHS*

Concrete

f'c = 4,500 psi

Reinforcing Steel

fy = 60,000 psi

*For prestressed beams, see notes regarding Prestressed Girders.

GENERAL CONSTRUCTION

- All mild reinforcing steel shall conform to ASTM A615, Grade 60.
- All exposed concrete corners and edges shall be chamfered 3/4" unless noted otherwise.
- Use 2" clear cover on all reinforcing steel except as shown.
- Contractor shall imprint on the structure the date of new construction as specified and detailed on Standard Plate No. 460.02.
- Barrier Curbs shall be built normal to the grade.
- Request for construction joints or resteel splices at points other than those shown, must be submitted to the Engineer for prior approval. If additional splices are approved, no payment will be allowed for the added quantity of resteel.
- The elevation of the bridge deck is 13" above subgrade elevation.

INCIDENTAL WORK, STRUCTURE

- In place centerline Sta. 123+35.00 to centerline Sta. 127+62.50 is a 427.5' 7 span I-Beam Viaduct bridge with a 30'-0" clear roadway. The superstructure consists of a Steel I-Beams supporting a reinforced concrete slab with steel channel railing faced with steel Thrie beam continuous across the bridge. The deck has been overlaid with 0.37 inches of rubberized asphalt chip seal. The substructure consists of six 2 column reinforced concrete bents with web walls and reinforced concrete sill type abutments on 6 concrete columns, all of which are supported on spread footings on rock.
- Break down and remove the existing bridge, and approach/sleeper slabs if applicable, to the top of rock elevation, or as required to construct the new structure in accordance with Section 110 of the Specifications. All portions of the existing bridge shall be removed and disposed of by the Contractor on a site obtained by the Contractor and approved by the Engineer in accordance with the Environmental Commitments found in Section A.
- During demolition of the structure, efforts shall be taken to prevent material from falling into the river. Under no circumstances is asphalt allowed to fall into the river.
- The foregoing is a general description of the in-place bridge and should not be construed to be complete in all details. Before preparing the bid it shall be the responsibility of the Contractor to make a visual inspection of the structure to verify the extent of the work and materials involved. If desired by the original construction plans may be obtained for the Bridge Design.

NOTICE - LEAD BASED PAINT

Be advised that the paint on the steel surfaces of the existing structure contains lead. The Contractor should plan his/her operations accordingly, and inform his/her employees of the hazards of lead exposure.

DESIGN MIX OF CONCRETE

- All structural concrete shall be Class A45 unless otherwise indicated.
- Type II cement is required, except Type III may be used for the prestressed beams.
- Grout design mix shall be as specified in Section 460.2 K of the Specifications. A compressive strength of 2000 psi shall be attained by the grout prior to erection of any beams. Chamfer edges of grout pads ¾". The quantity of grout is included in and shall be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge.

ABUTMENTS

- The bridge ends shall not be backfilled beyond the expansion joint until the deck concrete has attained a strength of 1200 psi when controlled by test, or 36 to 48 hours, and determined by the Engineer when controlled by time.
- Backfill placed around the abutment backwalls shall be placed adjacent to both sides (front and back face) to approximately the same elevation at the same time to the berm elevation. Both abutments shall be backfilled simultaneously.
- Abutments shall not be cast until slab form elevations have been completed and approved by the Bridge Construction Engineer.

ABUTMENT BACKWALL COATING

The material for waterproofing the abutment backwall shall be one of the products from the approved products list. The acceptable abutment backwall coating suppliers are listed on the approved products list at the following Internet address:

<http://apps.sd.gov/applications/HC60ApprovedProducts/ProductList.aspx>

The cost of furnishing and applying the coating shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge.

REQUIRED LIST	
1	Title Block
2	Project Block
3	Estimate of Quantities
4	Notes

1

ESTIMATE OF STRUCTURE QUANTITIES AND NOTES

FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

STR. NO. 50-206-020

APRIL 2016

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OF

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WATERPROOFING MEMBRANE

1.

A 24" wide waterproofing membrane shall be used to seal the abutment backwall at the locations shown in the plans.
2.

The waterproofing membrane shall consist of two layers of rubberized mastic, a backing layer of woven polypropylene and an outside layer of impervious polyethylene similar to Mar Mac Seal Wrap or an approved equal. Mar Mac Seal Wrap is manufactured by the following company:

Mar Mac Construction Products Co., Inc.
PO Box 447 McBee SC 29101
Lee Murph Customer Service
Phone: (877) 962-7622
Company Phone: (843) 335-5814
Fax: (843) 335-5909
Website: www.marmac.com
3.

The materials for the waterproofing membrane shall meet the following properties:

a.

Rubberized Mastic:

	Minimum	Maximum
Ash-inert matter, %	80	15
Volatiles, %	0.1	2
Softening Temp., min, F	175	-
Specific gravity	0.95	1.05
Penetration, dmm	60	90
Flow, mm	10	10

b.

Reinforcing Mesh Element:

Tensile strength min, lb., in.		D1682 Warp 75 Fill 75
Elongation at break, min, %		Warp 20 Fill 20

c.

Polyethylene Backing:

Tensile strength, min, psi	4000	D882, Method A
Elongation at break, min %	100	D882, Method A
Tear resistance, min psi	1500	D624, Die C
Water absorption, max %	0.01	D570

4.

Field measurement for Waterproofing Membrane for Structure will not be made. The plan quantity will be the quantity accepted for payment.

5.

Waterproofing Membrane for Structure shall be paid for at the contract unit price per square foot. Payment shall be full compensation for labor, equipment, materials and incidentals for furnishing and installing the waterproofing membrane.

SPREAD FOOTING ON ROCK AT ABUTMENTS AND PIERS

1.

The rock surface shall be cleaned of all soil and debris prior to placing rock dowels and reinforcing steel for the spread footing. Cleaning shall be accomplished by water washing and/or air jetting. Material washed from the rock surface shall be directed into a sump or low area and physically removed from the exposed rock surface. The Geotechnical Engineer shall be contacted, once the rock has been cleaned, so that the rock may be inspected for condition and soundness.

2.

If upon inspection, the Geotechnical Engineer determines that the material at the plan shown footing elevation is unsuitable for foundation support or if sound bedrock is encountered at an elevation other than the plan shown footing elevation, the Engineer shall order the footing elevation changed to an elevation approved by the Geotechnical Engineer. If the footing elevations are changed, the Office of Bridge Design shall be contacted prior to proceeding with construction to determine if a redesign of the substructure unit is required. If a redesign is required, a maximum of 5 working days may be required to perform this design. Any costs associated to delays within the 5 working day period for redesign shall be borne by the contractor at no additional cost to the State.

3.

If the footing elevations are lowered due to bedrock conditions, the excavation below the plan shown footing elevation ordered by the Engineer will be paid for at the contract unit price per cubic yard for Structure Excavation, Bridge. The additional concrete and reinforcing steel required for construction will be paid for at the contract unit price per cubic yard for Class A45 Concrete, Bridge and contract unit price per pound for Reinforcing Steel, respectively.

4.

The cost of cleaning the rock shall be included in the contract unit price per cubic yard for Structure Excavation, Bridge. Payment shall be considered full compensation for all materials, labor equipment and incidentals necessary to satisfactorily complete the work.

5.

Due to the possibility of variance in the final elevations for the footings, the reinforcing steel in the abutments and piers shall not be ordered until final footing elevations have been approved by the Geotechnical Engineer.

REQUIRED LIST

1

Title Block

2

Project Block

3

Notes

2

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			

COFFERDAMS

1.

It is anticipated that cofferdams will be necessary at pier locations. Cofferdams shall be designed and constructed in accordance with Section 423 of the Specifications. Due to the irregular surface of the bedrock, additional effort will be required to seal the cofferdam.

2.

The design of the Cofferdam must be done by Professional Engineers registered in South Dakota. Sealed calculations of both the original design and design check, performed by different engineers, shall be submitted with the cofferdam plans. The cofferdam plans, design, and check design shall be submitted to the Office of Bridge Design a minimum of 15 days prior to Cofferdam construction.

ROCK DOWELS

1.

The steel dowels shall be deformed bars conforming to ASTM A615 Grade 60.

2.

Following the engineering evaluation of the foundation rock, the Engineer may order the number of dowels and/or spacing to be increased or decreased in accordance with the Geotechnical Engineer's recommendations. Increases or decreases in quantity shall be at the contract unit price per foot for Install Dowel in Rock.

3.

The steel dowel for use with the item Install Dowel in Rock is included in the Reinforcing Schedule and shall be paid for at the contract unit price per pound for Reinforcing Steel.

4.

Dowel bond material shall be a fast set polyester resin rock anchoring system in a 40 mm (minimum) capsule from one of the following manufacturers: Dywidag Systems International (Fasloc), Minova (Lokset), Williams Form Engineering Corp. The resin shall be suitable for bonding steel dowel bars to rock in the existing moisture conditions. The diameter of the hole, drilled into the rock, shall be a maximum of 3/8 inch larger than the diameter of the steel dowel, or as specified by the dowel bond material manufacturer. The drilled holes shall be blown out with compressed air using a device that will reach the bottom of the hole to ensure that all debris or loose material has been removed prior to epoxy injection. The Contractor shall submit dowel bonding material product data and installation plan to the Engineer for approval.

5.

Install Dowel in Rock shall not be measured unless a change is ordered. Payment shall be for the lineal foot of embedment into the rock, and shall be considered full compensation for all materials, labor, equipment and incidentals necessary to satisfactorily complete the work.

1

NOTES (CONTINUED)
FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

STR. NO. 50-206-020

APRIL 2016

3 OF 50

DESIGNED BY BB	CK. DES. BY TD	DRAFTED BY BT	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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3

2" RIGID GALVANIZED STEEL CONDUIT

- 1. Anchor rods and bolting pattern for luminaire REL2 and REL3 to be mounted on Pier 2 and Pier 4 of the bridge shall be obtained and supplied by the Contractor to the Bridge Contractor as indicated in Section L of the plans. Payment for installing the anchor rods shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge Deck
- 2. The 2" rigid galvanized steel conduit for Luminaire REL2 and REL3 shall be placed under the Bridge Deck and over the Pier by the Bridge Contractor as shown in the plans

SUPERSTRUCTURE

- 1. Girder lifting hooks shall be cut off before placement of concrete deck slab.
- 2. The diaphragms at the piers shall be poured integrally with the deck slab. Placement of diaphragms at the piers shall not slow down the rate of deck concrete placement and finishing. The Contractor shall place the concrete for the specified diaphragms ahead of the deck concrete in such a manner that advancement of the deck concrete reaches the diaphragm just as placement of concrete in the diaphragm is complete.
- 3. The deck-finishing machine shall be adjusted and operated in such a manner that the roller screed or screeds are parallel with the centerline of the bridge and the finish machine is parallel to the skew of the bridge. Concrete placement in front of the finish machine shall be kept parallel to the machine.
- 4. The bridge deck must be placed and finished continuously at a minimum rate of 55 ft. of deck per hour measured along Centerline Roadway. This rate is exclusive of concrete placed in the diaphragms. (See note 2 above.) If concrete cannot be placed and finished at this rate, the Engineer shall order a header installed and operations stopped. Notify the Bridge Construction Engineer if deck pour operations are stopped. Operations may resume only when the Engineer is satisfied that a rate of 55 ft. of deck per hour can be achieved and the concrete in the previous pour has attained a minimum compressive strength of 2000 psi.
- 5. Snap ties, if used in the barrier curb formwork, shall be epoxy coated. The epoxy coating shall be inert in concrete and compatible with the coating applied to the new epoxy coated reinforcing steel.
- 6. See Special Provision for Concrete Penetrating Sealer
- 7. The 1/4" diameter concrete inserts for conduit clamps shall be commercially available inserts threaded for use with a galvanized 1/4" diameter A307 bolt. The inserts shall be capable of developing the strength of A307 bolt and shall be galvanized or stainless steel. The cost of furnishing and installing the inserts and the 2" diameter galvanized conduit in the barrier curb shall be incidental to the contract unit price per cubic yard for class A45 Concrete, Bridge Deck.

REQUIRED LIST

- 1 Title Block
- 2 Project Block
- 3 Notes

PRESTRESSED GIRDERS

- 3. Minimum concrete compressive strength f'c = 8500 psi at 28 days for all girders, f'ci = 7000 psi for all Girders.
- 4. All mild reinforcing steel shall be deformed bars conforming to ASTM A615, Grade 60.
- 5. Individual tendons in all pretensioned sections shall consist of seven wire uncoated Type 270K Strands having a nominal diameter of 0.6" and a minimum ultimate strength of 58600 lbs. per cable. An initial tensile force of 43500 lbs. shall be applied to all 0.6" cables in all girders. All prestressing steel shall conform to AASHTO M203. (low lax strands).
- 6. All prestressed girders within a span shall be cast within an 8 day period. If not, the newest girder shall be at least 6 weeks old before the deck slab is poured. The girders shall be poured in all steel forms.
- 7. Prestressed concrete girders shall always be lifted by the devices provided in the top flanges near the ends of the girders. Types of lifting devices other than those shown on the plans may be used provided they are approved by the Office of Bridge Design. The design of the lifting devices shall be the responsibility of the Fabricator.
- 8. Each beam shall be marked showing structure number, casting date, and beam number. Marking shall be on the face of the beam near the end and so located that they will be exposed after the diaphragms have been cast. Facia beams shall be marked on an inside face. All markings shall be stenciled and clearly legible. For beam designations and locations, see Erection Data and Slab Form Elevations (A) sheet.
- 9. The physical properties of the elastomeric bearing pads shall conform to the requirements of Section 18.2 of the AASHTO LFRD Bridge Construction Specification and the AASHTO Materials Specification M251. The elastomeric bearing pads shall conform to Grade 60 (durometer). The cost of the pads shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge. Certification that pads are 60 durometer and meet the requirements of AASHTO LFRD Bridge Construction Specification Section 18.2 and AASHTO Materials Specification M251 shall be furnished to the Engineer with the shop drawings. No laminated bearing pads will be allowed.
- 10. All exposed corners shall be chamfered 3/4" or rounded to 3/4" radius.
- 11. Dead Load of girder taken as effective at transfer. Cut strands, except those extended and bent, flush with end of girder and coat end of strands with mortar.
- 12. The Contractor shall be responsible for ensuring that transportation stresses, handling and erection do not cause damage to the girders.
- 13. Furnish and Install Inserts for T8 Rebars as shown in the plans. All costs involved shall be incidental to the contract unit price per foot of girder.

DECK DRAINS

- 1. Deck Drains shall be 4" diameter x 5'-8" Fiberglass Pipe conforming to the requirements of ASTM - D2996.
- 2. The Fiberglass Pipe Sleeve can be made from a 4 inch diameter Fiberglass Pipe Fitting. It shall be attached to the 4 inch diameter Fiberglass Pipe, as shown in the plans, per the manufacturer's recommendation.
- 3. All fiberglass pipe and pipe fittings shall be handled and installed according to the guidelines and procedures recommended by the manufacturer. Pipe, pipe fittings, and adhesive must be from the same manufacturer.
- 4. Use fiberglass wear pads to protect against contact with supports or U-bolts.
- 5. The 1/2 inch diameter U-bolts, nuts and washers shall conform to ASTM A307 Grade 36 and shall be galvanized in accordance with ASTM F2329.
- 6. The deck drain to girder connection as shown in the plans allows the deck drain location to be adjusted slightly to clear transverse slab steel.
- 7. All fiberglass pipes and pipe fittings shall use pigmented resin throughout the wall. The color shall be an approved gray (Federal Standard 595B Color 26622).
- 8. Steel for the bent plates and washers shall conform to ASTM A709 Grade 36 and shall be galvanized in accordance with ASTM A123. Washers shall be plate washers or a continuous bar at least 5/16" thick with standard holes and shall have a size sufficient to completely cover the slot after installation.
- 9. The 1/2 inch diameter bolts and nuts shall conform to ASTM A307 and shall be galvanized in accordance with ASTM F2329 or ASTM A153 as applicable.
- 10. The 1/2 inch diameter concrete inserts shall be capable of developing the strength of the A307 bolts and shall be galvanized.
- 11. Maintain 2" clear cover between the back of the concrete inserts and the adjacent girder web.
- 12. Payment for deck drains shall be at the contract unit price per each for Deck Drain, Girder Bridge, and shall be full compensation for furnishing, fabricating, and installing the deck drains and all attaching hardware in accordance with the plans and specifications.

1

NOTES (CONTINUED)

FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

STR. NO. 50-206-020

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DESIGNED BY BB	CK. DES. BY TD	DRAFTED BY BT	Steve A. Johnson BRIDGE ENGINEER
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BOLT TESTING

The certified mill test reports for all bolts used on the project shall include the test results for all of the testing specified in Section 972.2 D of the Specifications. Some of these tests are supplemental tests that must be requested at the time the bolts are ordered. It is the responsibility of the Contractor to notify the bolt supplier of these requirements.

FALSEWORK

The Contractor shall be required to include with the Falsework Plans, details for the construction of an adequate "Walk-Way" including railing.

FALL PROTECTION

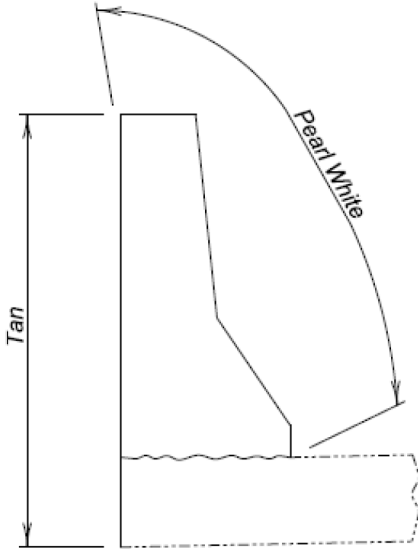
- 1. The Contractor shall install a Fall Protection System conforming to OSHA Regulations. When working on the girders prior to decking installation, a Horizontal Lifeline – or other OSHA approved system shall be installed. The Contractor shall have one Personal Fall Arrest System (PFAS) available for use by a Department Inspector. The PFAS shall be compatible with the installed Fall Protection System.
- 2. Modifications to any bridge components used to accommodate the Fall Protection System shall be shown on the Falsework Plans and/or the appropriate Shop Plans. Field welding to bridge components will not be allowed. Field placed concrete inserts or drilled-in anchor bolts will be allowed if approved by the Engineer. All costs associated with providing the Fall Protection System shall be incidental to the other contract items.

CLASS B COMMERCIAL TEXTURE FINISH

- 1. A Class B commercial texture finish shall be applied to the following areas:
 - a. ***Abutments:** all exposed surfaces to an elevation 1-foot below finished ground line.
 - b. **Barrier Rail:** all exposed surfaces (**front, **top and *back).
 - c. ***Slab:** edge of slab.
 - d. ***Girder:** Outside face of fascia girders.
 - e. ***Piers:** All exposed surfaces.

* Color shall be tan
** Color shall be Pearl White
- 2. The Class B commercial texture finish shall be applied in accordance with Section 460.3 L.1.c of the Specifications.
- 3. Where the Class B commercial texture finish is to be applied, concrete curing shall be accomplished with cotton or burlap mats and polyethylene sheeting. Curing shall continue for not less than seven days after placing concrete before the commercial texture finish is applied. The commercial texture finish shall be applied in accordance with the manufacturer's recommendations. The commercial texture finish itself does not require a specific cure except for drying.

- 4. The cost of the Class B Commercial Texture Finish applied to the fascia girders shall be incidental to the contract unit price per cubic yard for Class A45 Concrete, Bridge Deck.



STEEL RAILING - SIDEWALK

- 1. All rail and chain link fence posts shall be built vertical.
- 2. All structural steel parts for railing shall conform to ASTM A500, Grade B. Material less than ¼" thick may be ASTM A1011, Grade 36. Rail post base plates shall conform to ASTM A709, Grade 36.
- 3. All anchor bolts and nuts for railing shall conform to ASTM A307. Washers shall conform to ASTM F436 and all components shall be galvanized in accordance with ASTM A153 or ASTM F2329, as applicable. The bolts shall be hex head "structural" type with heavy hex nuts and round washers.
- 4. All anchor bolts shall be tightened to a torque of 120 ft.-lbs. (approximated without the use of a calibrated torque wrench).
- 5. The non-shrink grout used to fill the recess beneath the rail post base plates shall be a commercially available non-shrink grout containing no metallic particles and capable of attaining a 28 day compressive strength of 3000 psi. The non-shrink grout shall be mixed according to the manufacturer's recommendations. The cost of furnishing and placing the non-shrink grout shall be incidental to the contract unit price per foot for Steel Pedestrian Railing on Sidewalk.
- 6. All steel railing shall be painted in accordance with Section 411 of the Specifications and the color shall be an approved brown (Federal Standard 595B Color 30045).
- 7. Welding & Weld Inspection shall be done in accordance with the current edition of AWS D1.1 Structural Welding Code-Steel.
- 8. The costs of structural steel, welding, weld inspection, painting and galvanizing shall be incidental to the contract unit price per foot for

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			

Steel Pedestrian Railing on Sidewalk and Steel Pedestrian Railing on Concrete Barrier.

CHAIN LINK FENCE

- 1. The chain link fence fabric and supports shall conform to Section 930 of the Specifications as modified by the following notes.
- 2. The chain link fence fabric, wire ties and miscellaneous hardware shall be galvanized and conform to AASHTO M181. The fence fabric shall be Type IV 9 gauge wire woven in a 2 inch diamond mesh. Knuckled selvage shall be used on the top and bottom of the fence fabric.
- 3. A brown (Federal Standard 595B Color 30045) thermally extruded polyvinyl coating shall be applied to the fence fabric, wire ties and all miscellaneous hardware.
- 4. The item Chain Link Fence for Bridge Sidewalk shall be paid for by the linear foot. This payment shall be full compensation for furnishing all material, labor, tools and equipment necessary or incidental to the construction of the chain link fence including chain link fence fabric, wire ties, miscellaneous hardware, painting and welding, all to satisfactorily complete this work.


REQUIRED LIST

- 1 Title Block
- 2 Project Block
- 3 Notes

NOTES (CONTINUED)

FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE

STR. NO. 50-206-020
APRIL 2016

DESIGNED BY BB	CK. DES. BY TD	DRAFTED BY BT	 BRIDGE ENGINEER
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APPROACH SLABS

- 1. Sleeper slab riser shall be cast with the approach slab or cast after the approach slab is placed. Care shall be taken to ensure the correct grade is maintained across the joint.
- 2. The portion of the sleeper slab below the construction joint may be precast. If the bottom portion of the sleeper slab is precast, the Contractor shall submit proposed lifting and setting plans to the Bridge Construction Engineer for approval. In addition, if reinforcing or other details differ from those shown in the plans, the Contractor shall submit proposed alternate details for approval.
- 3. The use of an approved finishing machine will be required during placement of Class A45 Concrete for the approach slabs. Concrete placement in front of the machine shall be kept parallel to the screed.
- 4. The concrete in the approach slab shall be tined normal or parallel to centerline roadway.
- 5. Concrete Approach Sleeper Slab for Bridge, whether cast-in-place or precast, will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling, and placing all materials including concrete and reinforcing steel; for disposal of all excavated material and surplus materials; and for labor, tools, equipment and any incidentals necessary to complete this item of work.
- 6. Concrete Approach Slab for Bridge will be paid for at the contract unit price per square yard. This payment shall be full compensation for all excavation, furnishing, hauling and placing all materials including concrete, asphalt paint or 4 mil polyethylene sheeting, elastic joint sealer and reinforcing steel; for disposal of all excavated material and surplus materials and for labor, tools, equipment and any incidentals necessary to complete this item of work.

AS - BUILT ELEVATION SURVEY

The Contractor shall be responsible for recording the As-built deck elevations and bridge survey marker elevations at the locations shown in the Table of As-Built Elevations shown in the plans. All costs associated with obtaining the elevations including all equipment, labor and any incidentals required shall be incidental to the contract lump sum price for Bridge Elevation Survey.

SIDEWALK APPROACH SLABS

- 1. The reinforced concrete sidewalks adjacent to the bridge shall be paid for at the contract unit price per square foot for 6" Reinforced Concrete Sidewalk. This payment will be full compensation for all excavation, furnishing, hauling and placing all materials including concrete, epoxy coated reinforcing steel, asphalt paint or 4 mil polyethylene sheeting, hot poured elastic joint sealer; for disposal of all excavated and surplus materials; and for all labor, tools, equipment and incidentals necessary to complete this item of work.
- 2. The top of the top of approach

REQUIRED LIST

- 1 Title Block
- 2 Project Block
- 3 Notes

- 3. All costs involved in furnishing and placing the sidewalk sleeper slabs shall be included in the contract unit price per square foot for 6" Reinforced Concrete Sidewalk.

INSTALLING DOWELS FOR BARRIER CURBS

- 1. The epoxy resin mixture shall be of a type of bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV (Equivalent to ASTM C881 Type IV).
- 2. The bridge deck shall have been wet cured for a minimum of 7 days prior to starting any drilling operations. The diameter of the drilled holes shall not be less than 1/8 inch greater, nor more than 3/8 inch greater than the diameter of the dowels or as per Manufacturer's recommendations. Use compressed air or other techniques to insure that the hole is free of any loose material before epoxy resin is applied.
- 4. Holes drilled in the existing concrete shall be true and normal or as shown in the plans. Care shall be taken not to damage the existing reinforcing steel or spall the bottom of the bridge deck during drilling operations. It is likely that some of the existing reinforcing steel shown in the plans may have been placed out of position during construction. Therefore, prior to the start of drilling any holes, an effort will be made by Department forces to mark on the concrete surface, where practical, any locations of in-place reinforcing steel. In spite of this precaution, the Contractor can still expect to encounter reinforcing steel which will require shifting of the dowel spacing, as approved by the Engineer, to miss the existing reinforcing steel.
- 5. No loads shall be applied to the epoxy grouted dowel bars until the epoxy resin has had sufficient time to cure as specified by the epoxy resin Manufacturer.
- 6. Mix the epoxy resin as recommended by the Manufacturer and apply an injection method as approved by the Engineer. Fill the holes from the bottom up 1/3 to 1/2 full of epoxy, or as recommended by the manufacturer, prior to insertion of the steel bar. Rotate the steel bar during installation to eliminate void and ensure complete bonding of the bar. Insertion of the bars by the dipping method will not be allowed.
- 5. Embed dowels 6 1/4 inches into the existing concrete.
- 6. The cost of epoxy resin, dowels (C and CO bars), drilling, installation and other incidental items shall be incidental to the contract unit price each for Install Dowel in Concrete.

REINFORCED GRANULAR EMBANKMENT

- 1. The geogrid will be a biaxial grid of single layer construction. Vibratory welded, integrally formed, or woven and coated geogrids will be acceptable. Grids with laser welded grid junctions will not be allowed. The geogrid will be certified by the supplier to meet the following specification prior to installation:

Property	Test	MARV
Wide Width Strip Tensile Strength (Ultimate)	ASTM D 6637 Method B	850lb/ft MD and XD

- 2. Geogrid will be paid for at the contract unit price per square yard for Geogrid Reinforcement. Payment quantities will be based on area covered plus 15%. Overlaps are accounted for by the additional 15%. Payment will be full compensation for furnishing and installing the geogrid only.
- 3. Granular Material will conform to the specification for Base Course in Section 882 of the Specifications. Granular Material will be paid for at the contract unit price per ton for Base Course. Payment will be full compensation for furnishing and placing this material.
- 4. The geogrid shall be placed on a level surface and overlapped a minimum of 2 feet.
- 5. The geogrid will be placed as taut as possible with minimal wrinkles. Placement will be done so that subsequent granular cover material does not shove, wrinkle or distort the in place geogrid. The overlaps will be shingled in a manner that assures granular material will not be forced under the geogrid during backfilling operations. The geogrid may be held in place with small piles of granular material or staples.
- 6. Base course will be dumped at least 20 feet behind the leading edge of the backfill and pushed into place with a loader or dozer from the covered areas to the uncovered areas. No traffic will be allowed on the uncovered geogrid.
- 7. The base course and adjacent soil embankment shall be built simultaneously in horizontal layers. Base course shall be placed in 6 inch maximum lifts and compacted to 97 percent of maximum standard proctor dry density using a smooth face vibratory roller or vibratory plate compactor. Each layer of granular material shall be thoroughly watered prior to and during compaction.
- 8. Density tests within the berm limits shall consist of tests conducted both in the soil embankment and the base course according to the modified zone requirements below:

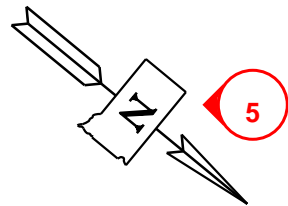
Zone	Depth (ft.)	Min. required tests
1	0-1	1
2	1-3	1
3	3-5	1
4	5 to Bottom	1 per 3 vertical feet

- 9. The zone requirement will be in force at both bridge berms.

NOTES (CONTINUED)

FOR 430' - 10 5/8" PRESTR. GIRDER BRIDGE

STR. NO. 50-206-020
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STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			

Sioux Quartzite is pink to red, hard silica cemented sandstone. It is jointed, bedded, and cross-bedded with thin red to purple pipestone shales and coarse conglomerate. Layers of poorly cemented sands may also be present. The surface of the quartzite is not flat. It may vary several feet vertically in a short horizontal distance.

The Geotechnical Engineering Activity has on file all of the boring logs for this project. These logs and additional results of laboratory test, if any, are available for review at the Central Office in Pierre.

LEGEND

Auger Test

All auger holes are drilled with a 4½ inch diameter or 2½ inch diameter continuous flight auger.

Boreholes from Station 124+40 to Station 126+60 were conducted through ice. The water table elevation at the time of investigation was approximately 1473.7. Borings conducted outside of this station range were dry at the time of investigation.

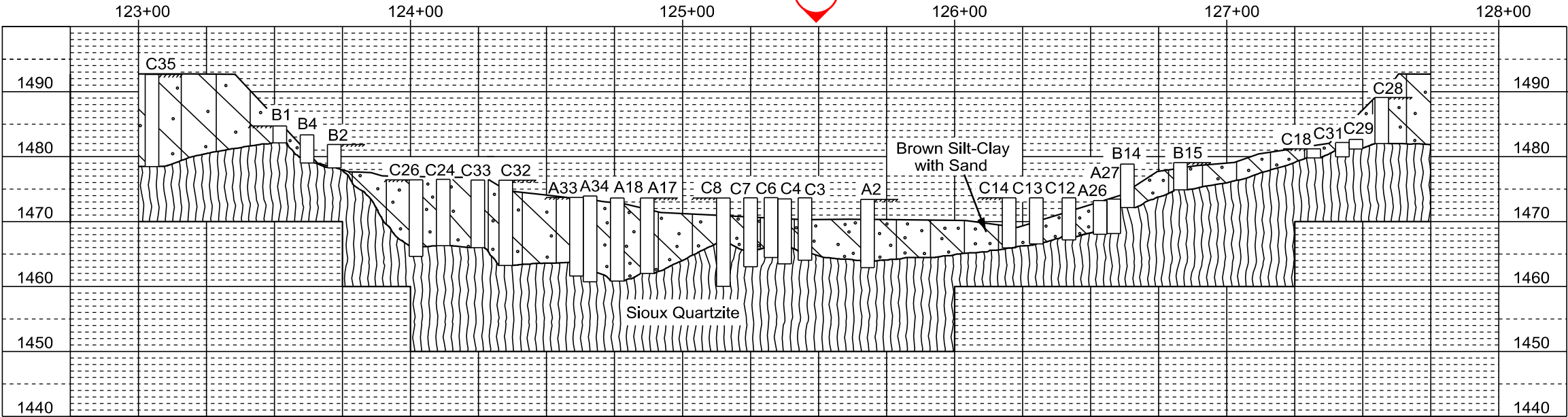
3

PLAN

REQUIRED LIST

- ① Title Block
- ② Project Block
- ③ Plan View (Piling Layout)
- ④ Subsurface Profile
- ⑤ North Arrow

4



1

SUBSURFACE INVESTIGATION

FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK
OVER BIG SIOUX RIVER
STA. 123 + 18.74 TO 127 + 49.63
STR. NO. 50-206-020

30° LHF SKEW
SEC. 9-T104N-R49W
P 0115(51)104
HL-93

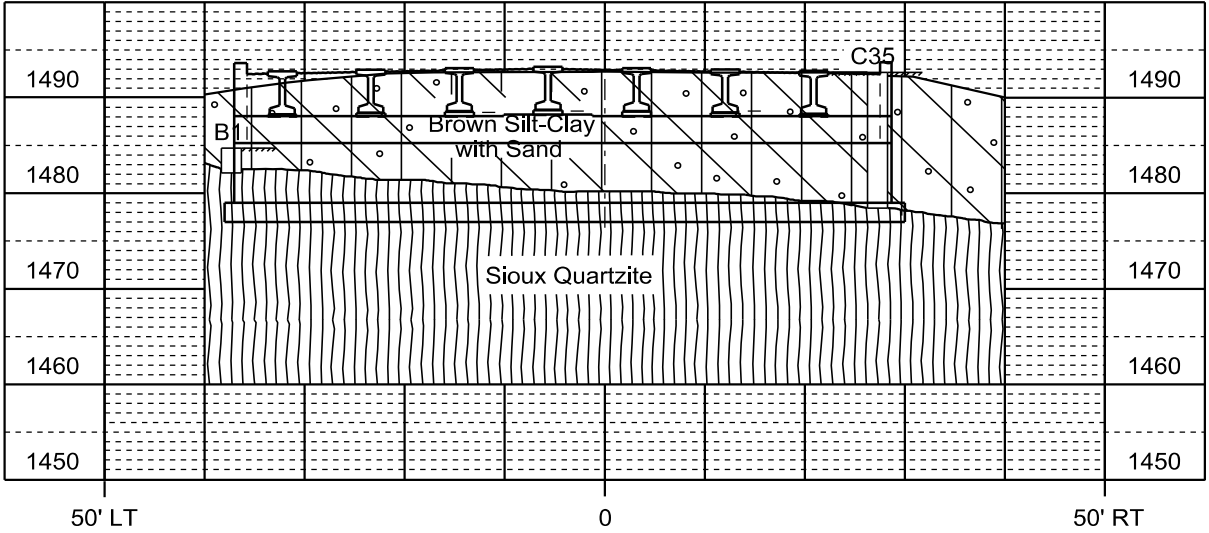
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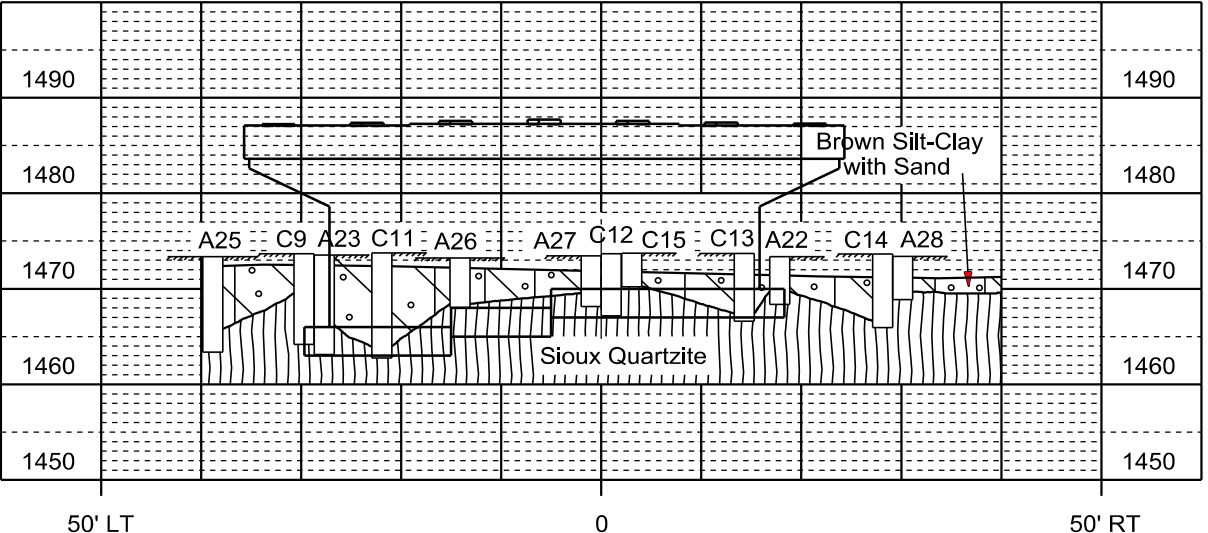
7 OF 50

DESIGNED BY JW/BB	CK. DES. BY TD	DRAFTED BY HK/MG	Steve A. Johnson BRIDGE ENGINEER
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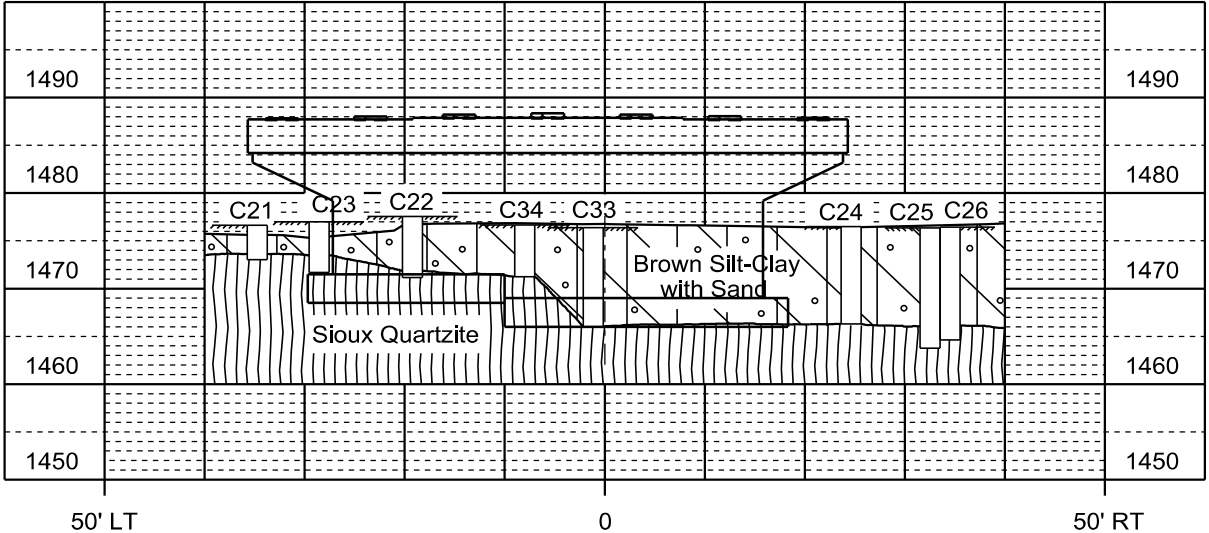
Elevation View Abut. No. 1



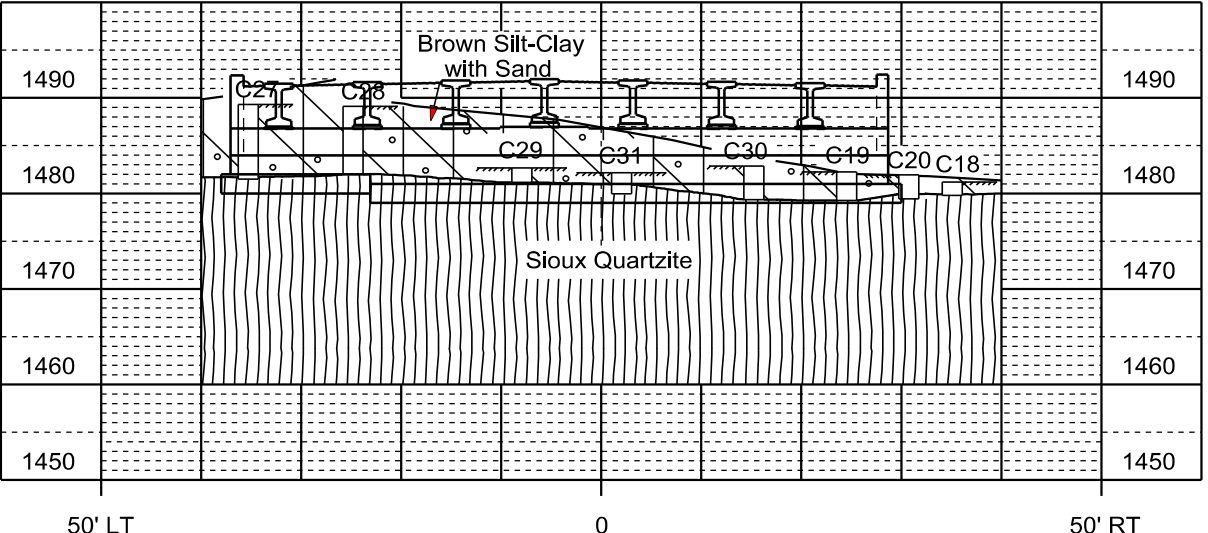
Elevation View Pier No. 4



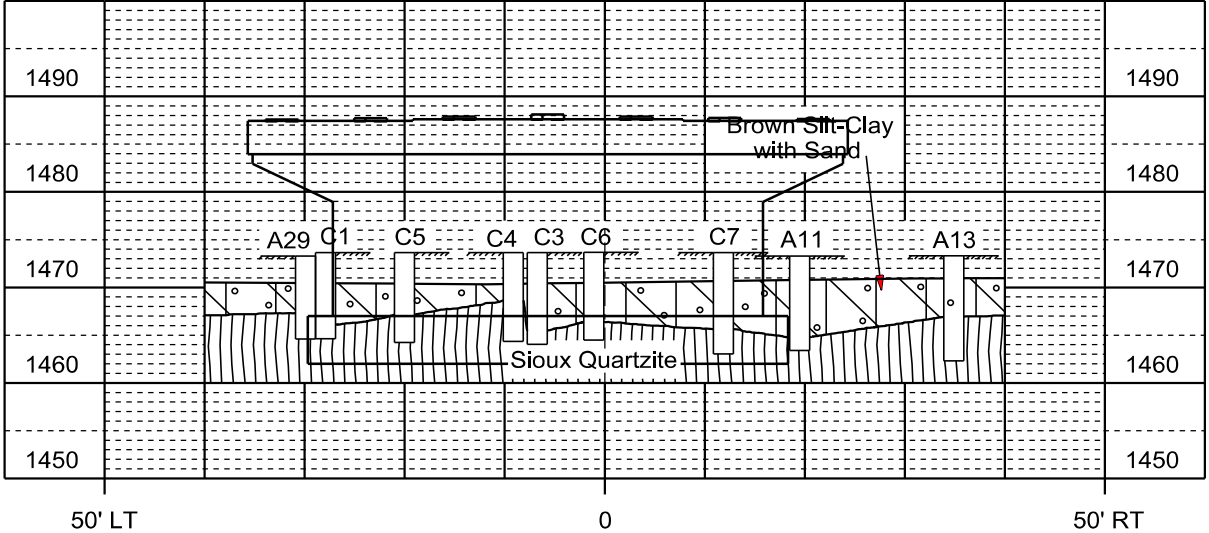
Elevation View Pier No. 2



Elevation View Abut. No. 5



Elevation View Pier No. 3



Elevation views are cross sections along centerline of the proposed substructures.

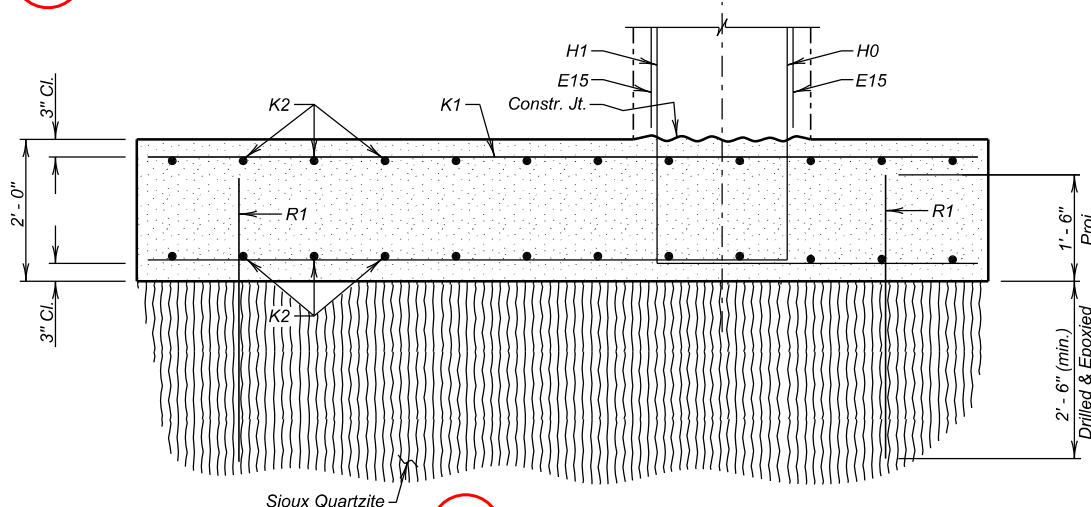
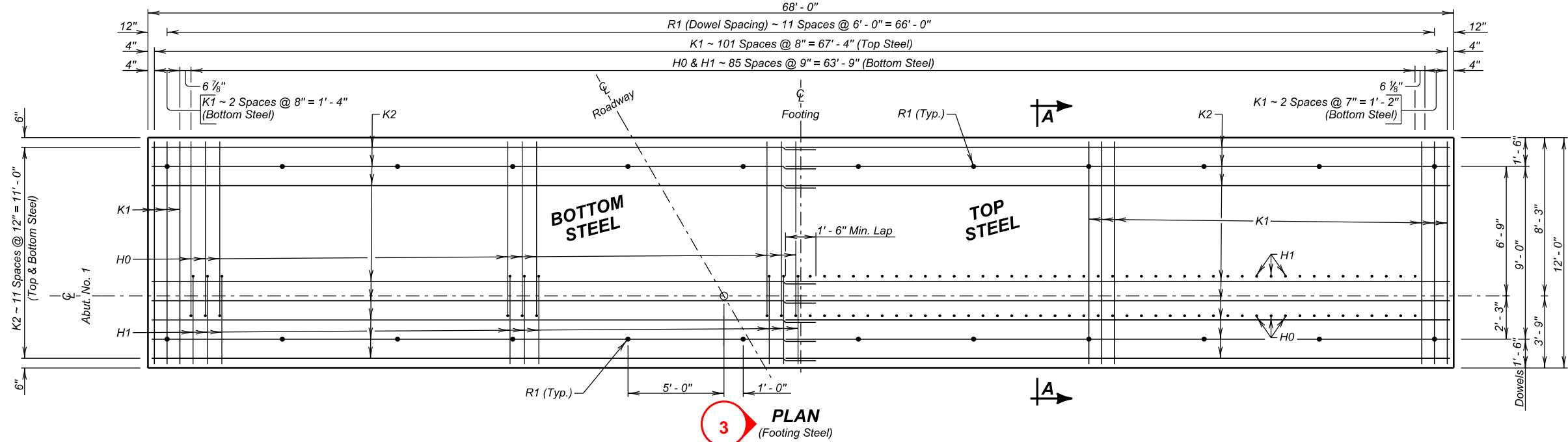
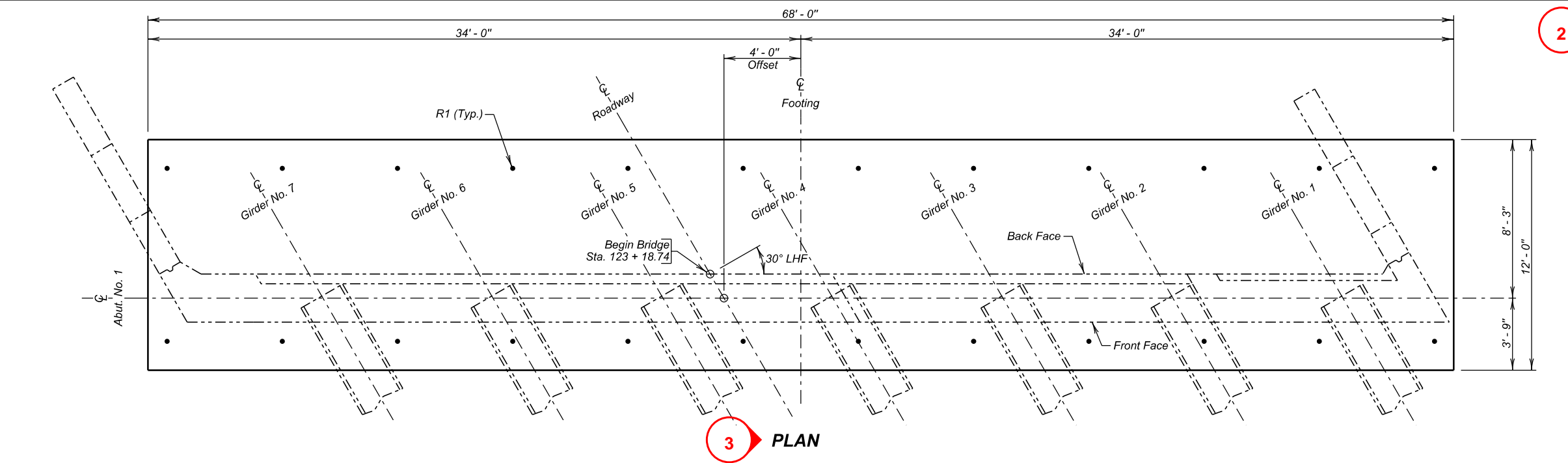
Boreholes depicted in elevation views for Pier No. 3 and Pier No. 4 were conducted through ice. The water table elevation at the time of investigation was approximately 1473.7. Borings conducted for Abut. No 1, Pier No. 2, and Abut. No. 5 were dry at the time of investigation.

SUBSURFACE INVESTIGATION CROSS SECTIONS
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

REQUIRED LIST

- ① Title Block
- ② Project Block
- ③ Elevations as Required
- ④ Notes as Required

MINNEHAHA COUNTY
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REQUIRED LIST

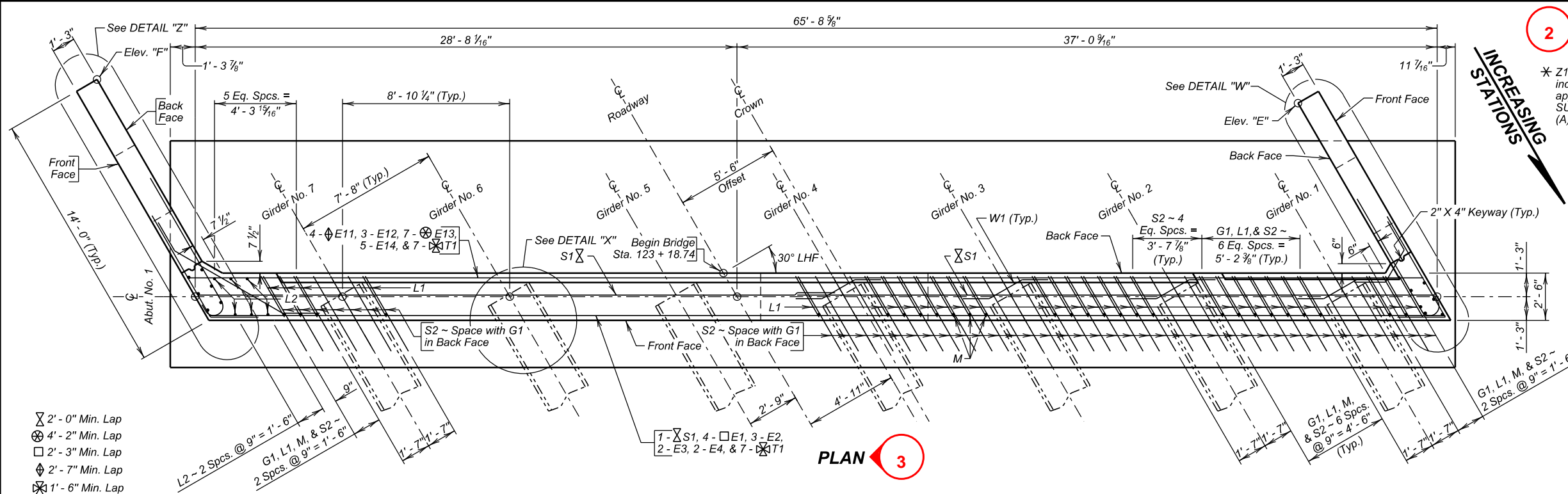
- | | |
|-------------------------|------------------------|
| ① Title Block | ④ Sections as Required |
| ② Project Block | |
| ③ Plan View as Required | |

1 ABUTMENT NO. 1 DETAILS (A) FOR

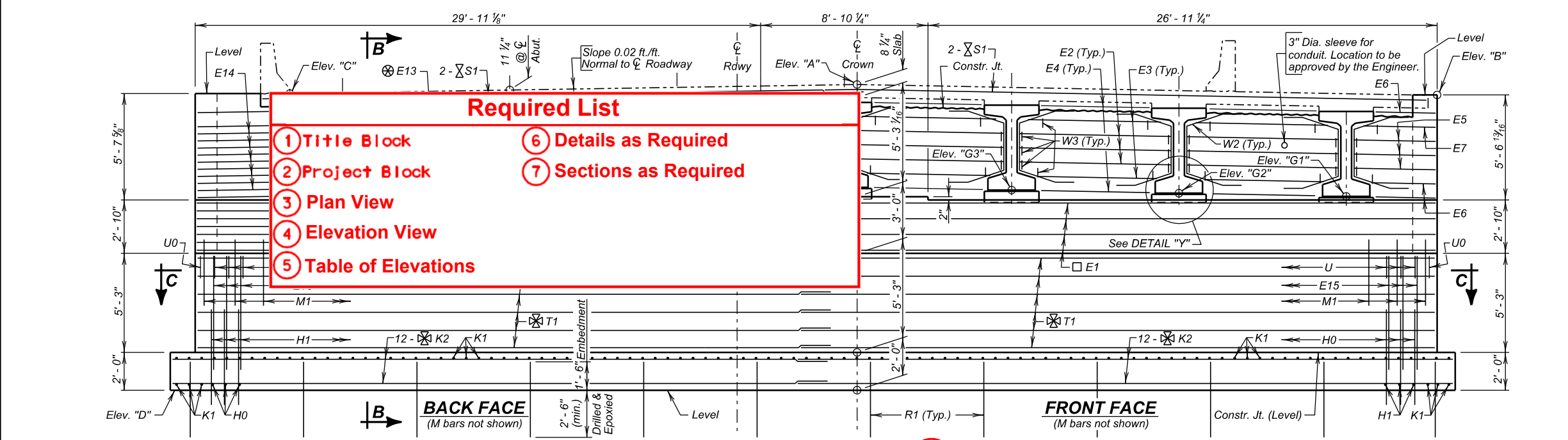
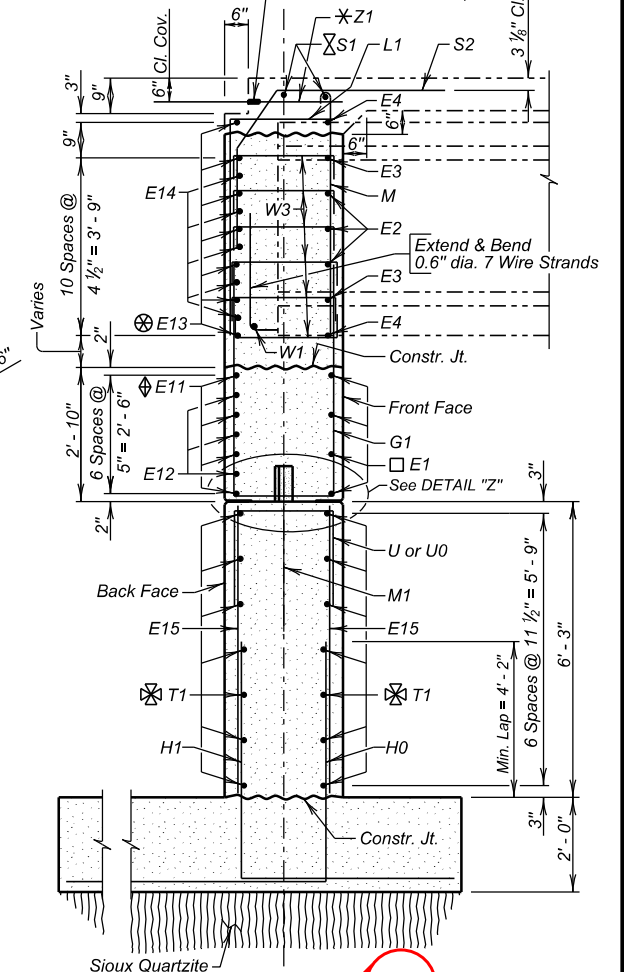
430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

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* Z1 and Z2 bars are listed and included in superstructure and approach slab quantities. See SUPERSTRUCTURE DETAILS (A) & (B).

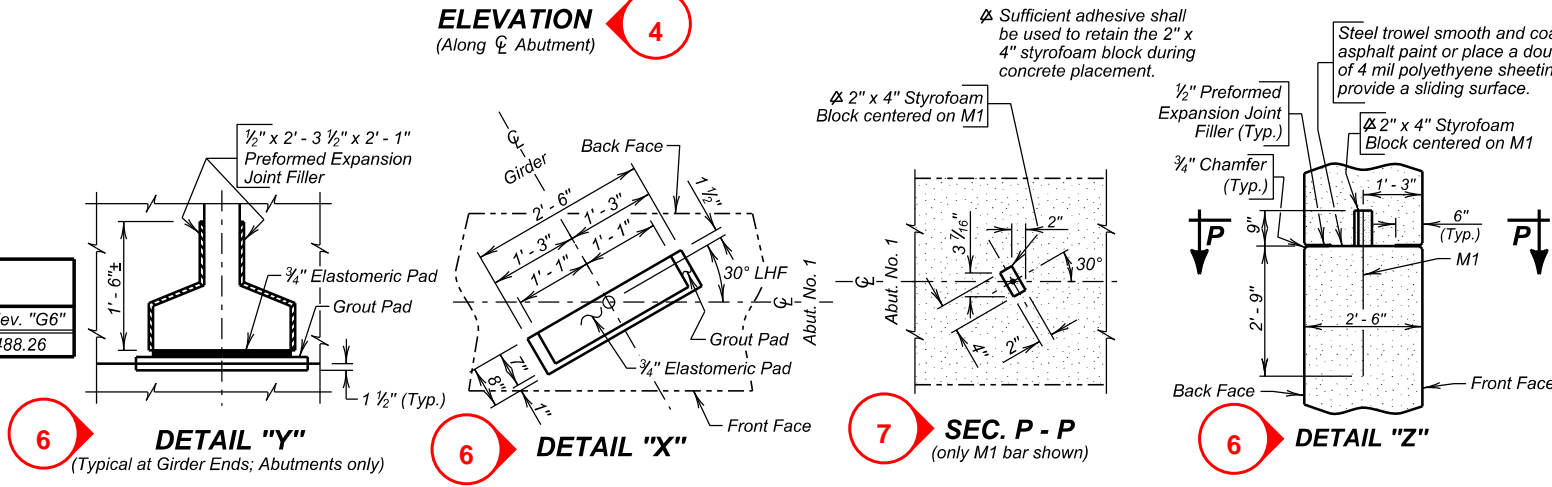


- Required List**
- 1 Title Block
 - 2 Project Block
 - 3 Plan View
 - 4 Elevation View
 - 5 Table of Elevations
 - 6 Details as Required
 - 7 Sections as Required

TABLE OF ELEVATIONS						
Abut. No.	Elev. "A"	Elev. "B"	Elev. "C"	Elev. "D"	Elev. "E"	Elev. "F"
1	1494.19	1493.63	1493.72	1478.00	1493.68	1493.70

TABLE OF ELEVATIONS							
Abut. No.	Elev. "G1"	Elev. "G2"	Elev. "G3"	Elev. "G4"	Elev. "G5"	Elev. "G6"	Elev. "G6"
1	1488.21	1488.37	1488.54	1488.68	1488.54	1488.40	1488.26

NOTE - Elev. "A", "B" and "C" are top of slab at \bar{C} of Abutment. Elev. "E" and "F" are at top of wingwall and top of slab elevation. Elev. "G1", "G2", "G3", "G4", "G5", "G6", and "G7" are top of grout pad elevations at \bar{C} Abutment. Top of Grout Pads shall be Level and Smooth.



ABUTMENT NO. 1 DETAILS (B)

FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW

OVER BIG SIOUX RIVER SEC. 9-T104N-R49W

STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104

STR. NO. 50-206-020 HL-93

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class A45 Concrete, Bridge	Cu. Yd.	149.0
Reinforcing Steel	Lb.	23615
Epoxy Coated Reinforcing Steel	Lb.	1460
Structure Excavation, Bridge	Cu. Yd.	365.6
Install Dowel in Rock	Ft.	60
Waterproofing Membrane	Sq. Ft.	124

NOTE:
Concrete shall be placed in the space under the beams (within the backwall width) during the pour. Care shall be taken to get the concrete vibrated into this area. If upon form removal the space is not completely filled and consolidated, the contractor shall grout the remaining voids.

REINFORCING SCHEDULE					Bending Details	
Mk.	No.	Size	Length	Type		
E1	8	6	33'- 11"	Str.	Type 14A	Type 17
E2	18	6	8'- 1"	Str.		
E3	12	6	6'- 3"	Str.		
E4	12	6	5'- 9"	Str.		
E5	3	6	4'- 4"	Str.	Type 19	Type 14
E6	3	6	3'- 2"	Str.		
E7	1	6	3'- 9"	Str.		
E8	3	6	7'- 3"	Str.		
E9	2	6	6'- 4"	Str.	Type 17	Type 19
E10	2	6	6'- 2"	Str.		
E11	8	7	34'- 1"	Str.		
E12	3	7	11'- 3"	Str.		
E13	14	9	34'- 11"	Str.	Type 17	Type 19
E14	5	10	16'- 6"	Str.		
E15	174	9	6'- 1"	Str.		
G1	51	5	12'- 5"	17		
H0	88	9	15'- 0"	17A	Type 17	Type 19
H1	88	9	10'- 6"	17A		
K1	108	7	11'- 10"	Str.		
K2	24	4	34'- 8"	Str.		
L1	48	4	6'- 11"	17A	Type 17	Type 19

- Required List
- 1 Title Block

2 Project Block

3 Reinforcing Schedule

4 Estimated Quantities

5 Elevation Views as Req'd

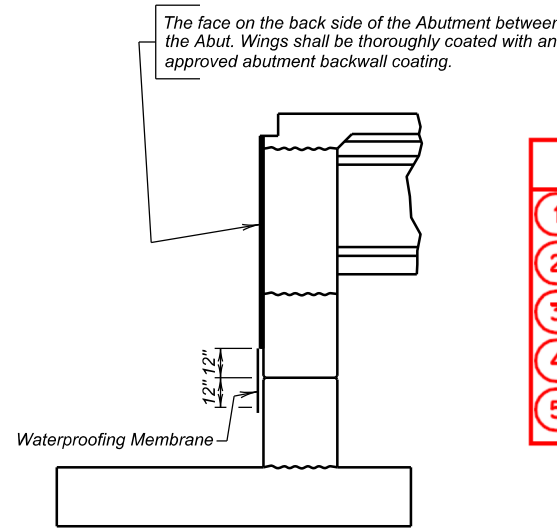
6 Details as Required

7 Sections as Required

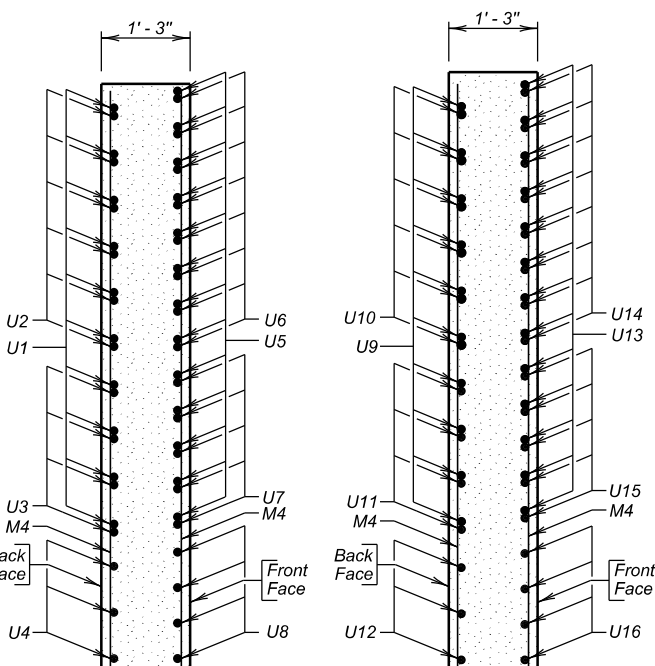
8 Abutment Backwall Coating

U0	2	5	7'- 2"	17	Type 19A	Type 19
U1	10	9	8'- 3"	1A		
U2	6	9	11'- 0"	Str.		
U3	4	9	7'- 0"	Str.		
U4	3	9	7'- 0"	1A	Type 19	Type 19A
U5	13	5	6'- 1"	19A		
U6	8	5	11'- 0"	Str.		
U7	5	5	7'- 0"	Str.		
U8	4	5	7'- 1"	19A	Type 19	Type 19A
U9	10	9	8'- 11"	1A		
U10	6	9	9'- 8"	Str.		
U11	4	9	5'- 8"	Str.		
U12	3	9	6'- 5"	1A	Type 19	Type 19A
U13	13	5	7'- 2"	19A		
U14	8	5	9'- 8"	Str.		
U15	5	5	5'- 8"	Str.		
U16	4	5	6'- 10"	19A	Type 19	Type 19A
W1	7	5	4'- 8"	19		
W2	14	4	8'- 6"	14		
W3	84	5	3'- 6"	17		

NOTE:
All dimensions are out to out of bars.
Δ Bars to be Epoxy Coated.



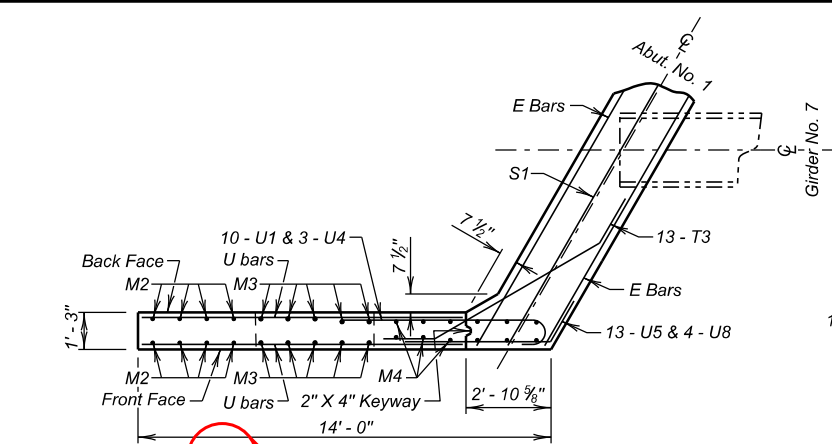
8 ABUTMENT BACKWALL COATING AND WATERPROOFING MEMBRANE DETAILS



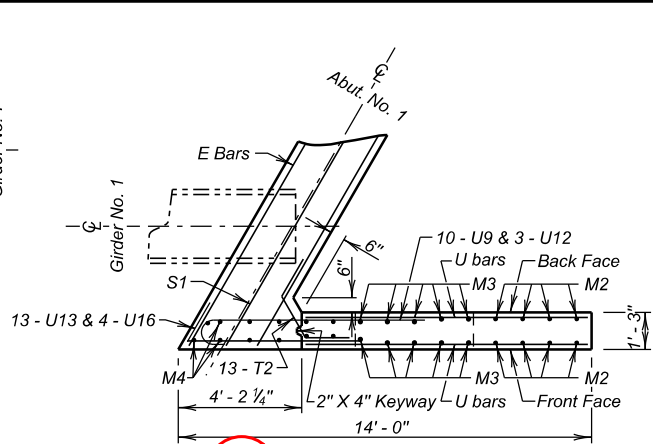
7 SEC. D - D 7 SEC. E - E

1 ABUTMENT NO. 1 DETAILS (C)
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

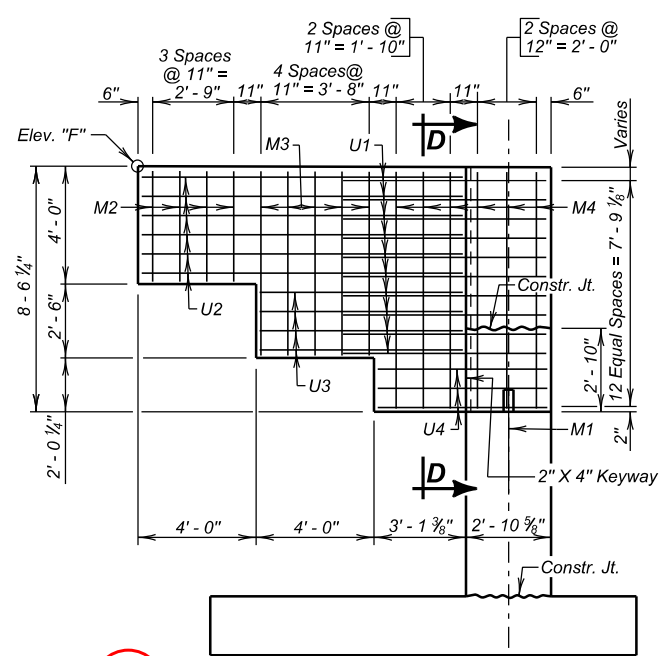
MINNEHAHA COUNTY
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APRIL 2016 12 OF 50



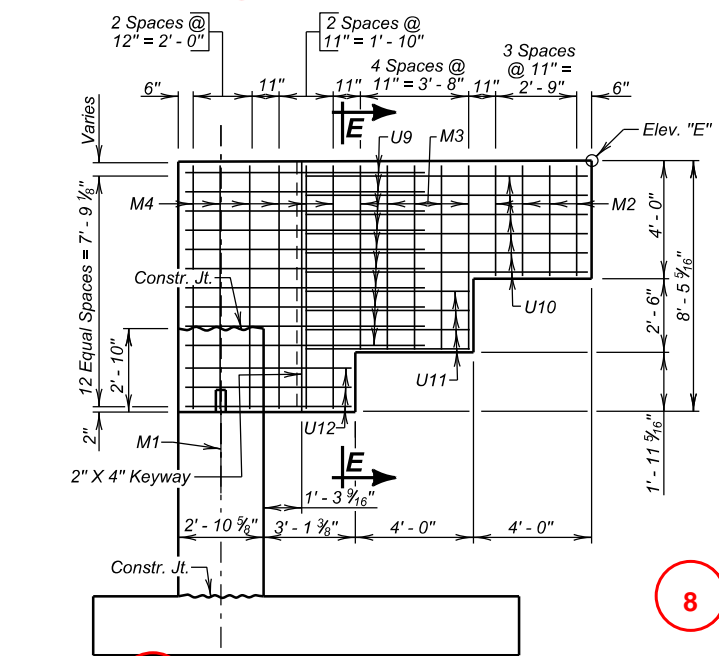
6 DETAIL 'Z'



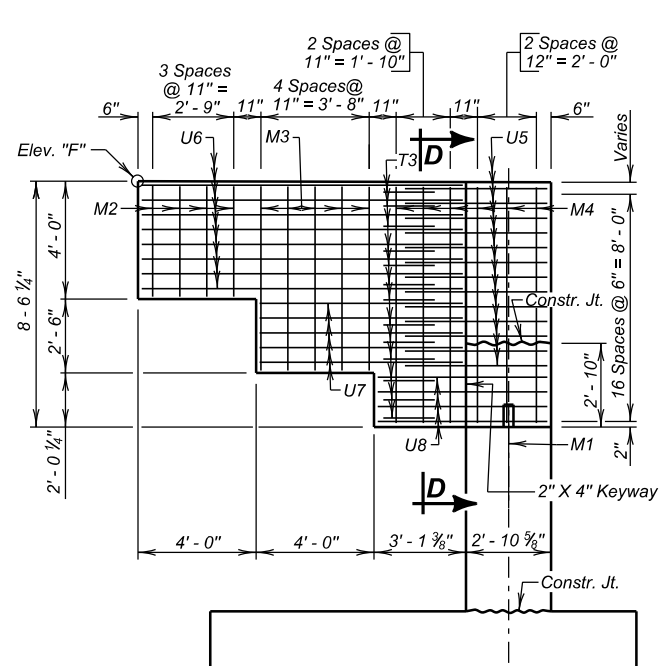
6 DETAIL 'W'



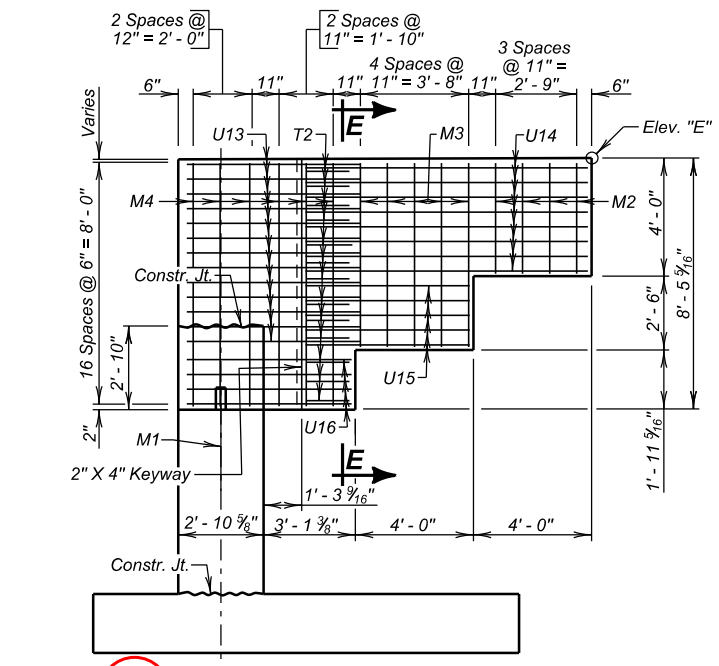
5 ELEVATION - BACK FACE



5 ELEVATION - BACK FACE



5 ELEVATION - FRONT FACE



5 ELEVATION - FRONT FACE

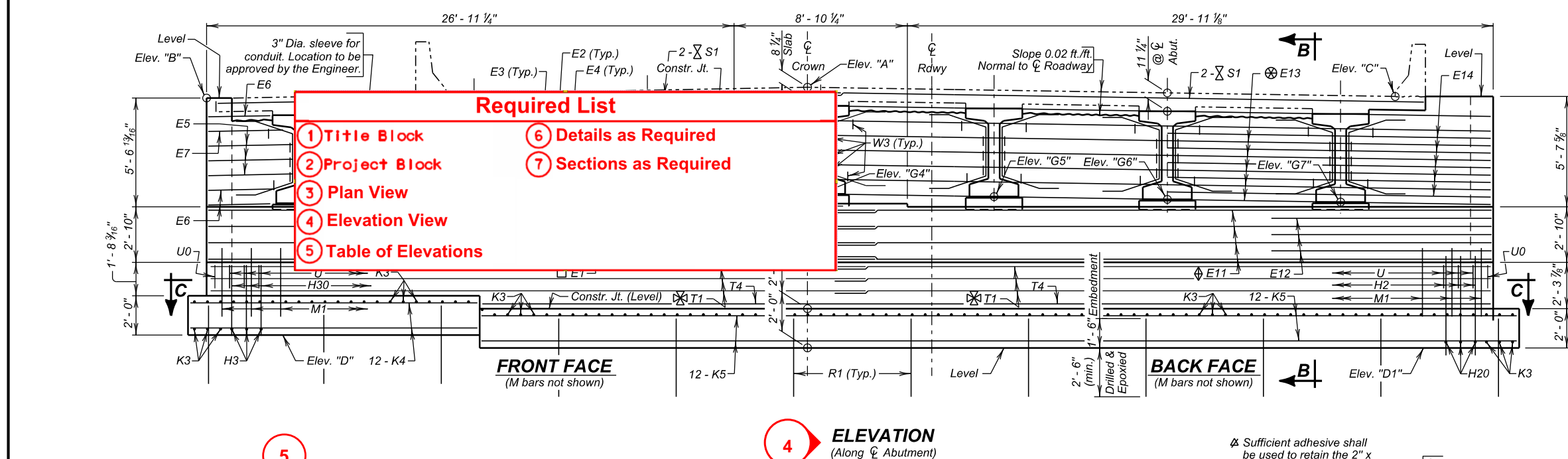
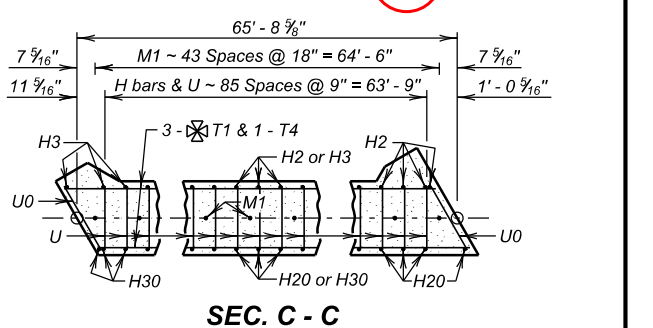
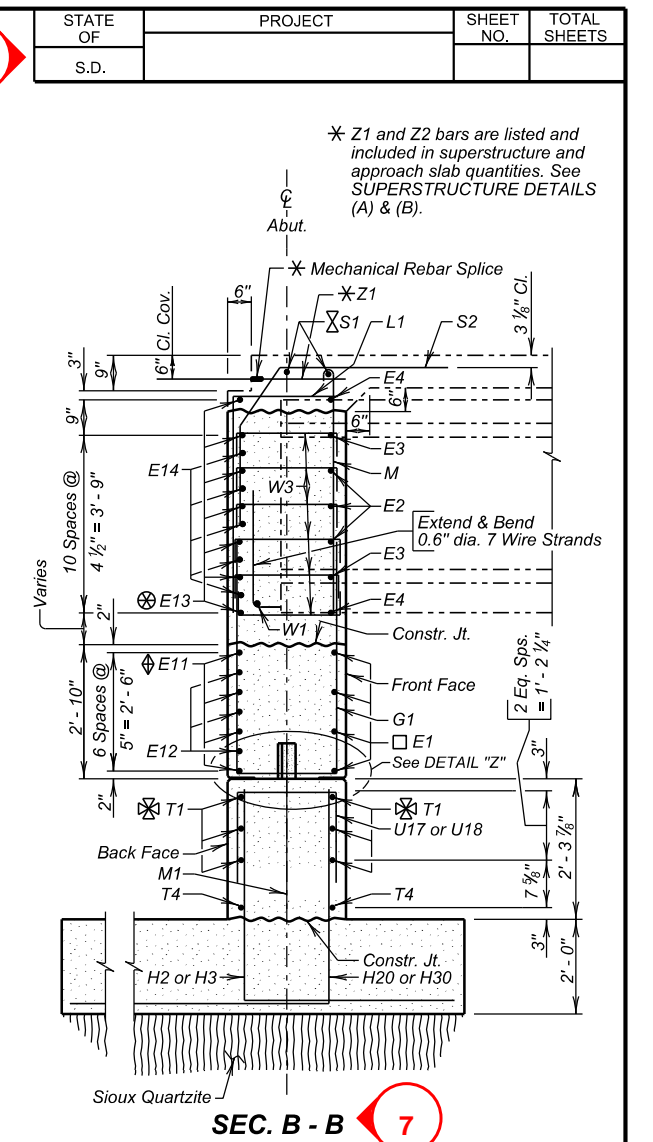
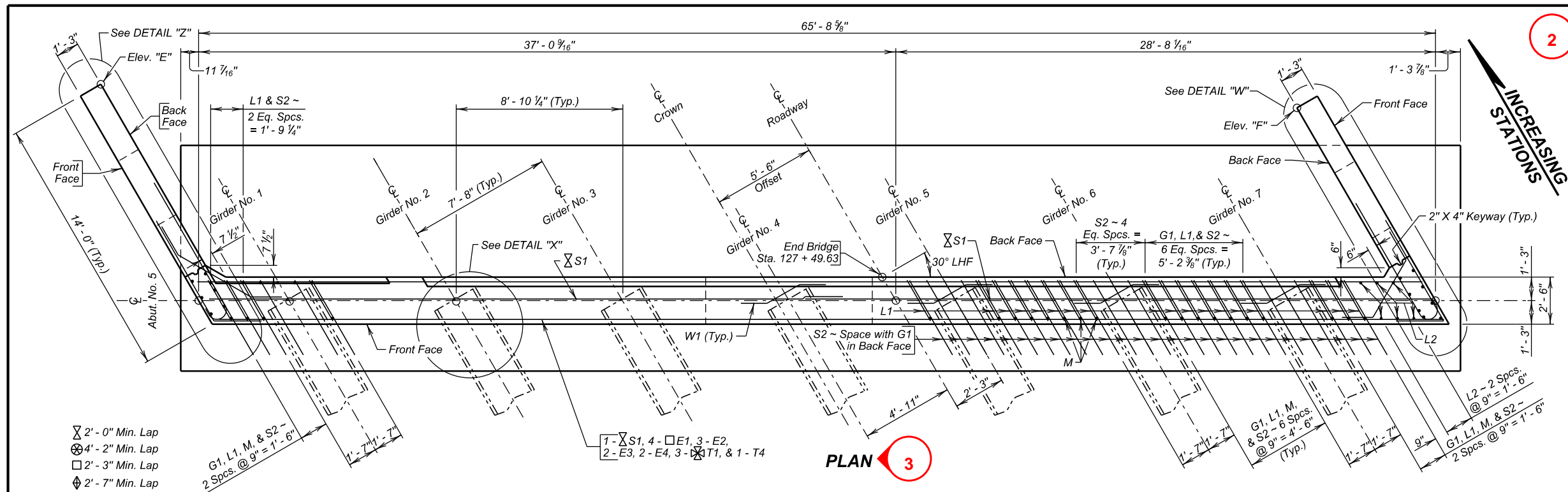
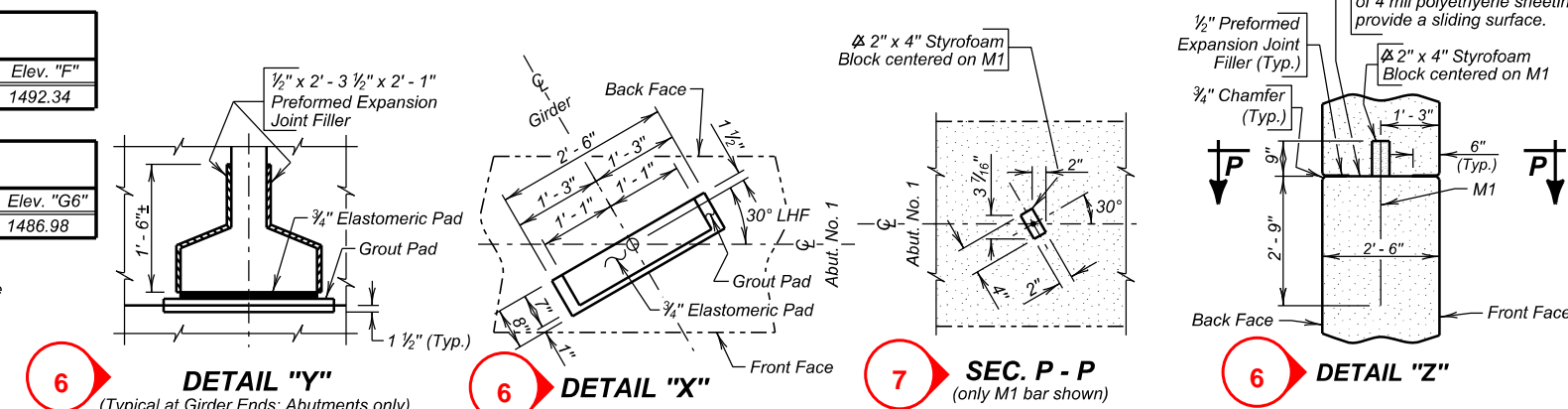


TABLE OF ELEVATIONS							
Abut. No.	Elev. "A"	Elev. "B"	Elev. "C"	Elev. "D"	Elev. "D1"	Elev. "E"	Elev. "F"
5	1492.91	1492.34	1492.44	1480.27	1479.60	1492.32	1492.34

TABLE OF ELEVATIONS							
Abut. No.	Elev. "G1"	Elev. "G2"	Elev. "G3"	Elev. "G4"	Elev. "G5"	Elev. "G6"	Elev. "G6"
5	1486 92	1487 09	1487 26	1487 40	1487 26	1487 12	1486 98

NOTE - Elev. "A", "B" and "C" are top of slab at C of Abutment. Elev. "E" and "F" are at top of wingwall and top of slab elevation. Elev. "G1", "G2", "G3", "G4", "G5", "G6", and "G7" are top of grout pad elevations at C Abutment. Top of Grout Pads shall be Level and Smooth.



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1 **ABUTMENT NO. 5 DETAILS (B)**

FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2016

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DESIGNED BY BB	CK. DES. BY TD	DRAFTED BY BT	<i>Steve A. Johnson</i> BRIDGE ENGINEER
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ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class A45 Concrete, Bridge	Cu. Yd.	127.9
Reinforcing Steel	Lb.	17097
Epoxy Coated Reinforcing Steel	Lb.	1460
Structure Excavation, Bridge	Cu. Yd.	228.0
Install Dowel in Rock	Ft.	60
Waterproofing Membrane	Sq. Ft.	124

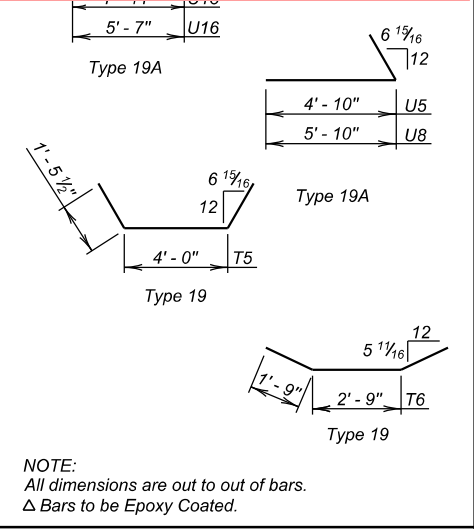
NOTE:
Concrete shall be placed in the space under the beams (within the backwall width) during the pour. Care shall be taken to get the concrete vibrated into this area. If upon form removal the space is not completely filled and consolidated, the contractor shall grout the remaining voids.

REINFORCING SCHEDULE					Bending Details	
Mk.	No.	Size	Length	Type		
E1	8	6	33'-11"	Str.	Type 14A	Type 17
E2	18	6	8'-1"	Str.		
E3	12	6	6'-3"	Str.		
E4	12	6	5'-9"	Str.		
E5	3	6	4'-4"	Str.	Type 19	Type 14
E6	3	6	3'-2"	Str.		
E7	1	6	3'-9"	Str.		
E8	3	6	7'-3"	Str.		
E9	2	6	6'-4"	Str.	Type 17	Type 14
E10	2	6	6'-2"	Str.		
E11	8	7	34'-1"	Str.		
E12	3	7	11'-3"	Str.		
E13	14	9	34'-11"	Str.	Type 17	Type 14
E14	5	10	16'-6"	Str.		
H2	69	8	9'-2"	17A		
H3	19	8	8'-2"	17A		
H20	69	8	13'-8"	17A	Type 17	Type 14
H30	19	8	12'-8"	17A		
K3	108	6	11'-10"	Str.		
K4	24	4	14'-8"	Str.		

Required List

- 1 Title Block
- 2 Project Block
- 3 Reinforcing Schedule
- 4 Estimated Quantities
- 5 Elevation Views as Req'd
- 6 Details as Required
- 7 Sections as Required
- 8 Abutment Backwall Coating

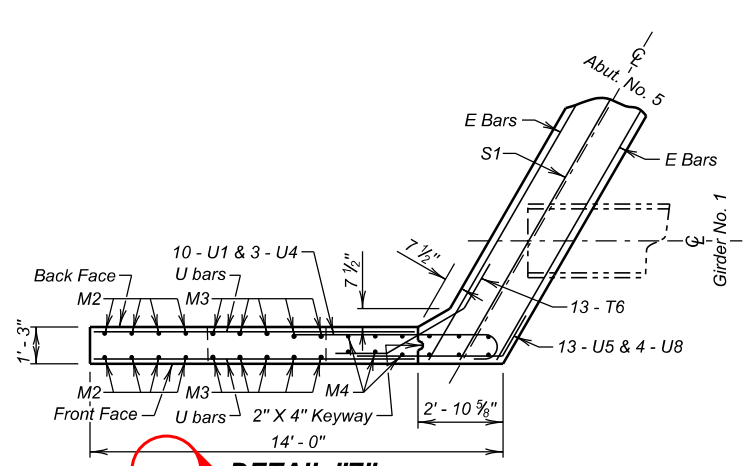
T6	13	6	6'-3"	19
U1	10	9	8'-3"	1A
U2	6	9	11'-0"	Str.
U3	4	9	7'-0"	Str.
U4	3	9	7'-0"	1A
U5	13	5	6'-1"	19A
U6	8	5	11'-0"	Str.
U7	5	5	7'-0"	Str.
U8	4	5	7'-1"	19A
U9	10	9	8'-11"	1A
U10	6	9	9'-8"	Str.
U11	4	9	5'-8"	Str.
U12	3	9	6'-5"	1A
U13	13	5	7'-2"	19A
U14	8	5	9'-8"	Str.
U15	5	5	5'-8"	Str.
U16	4	5	6'-10"	19A
U17	2	5	6'-0"	17
U18	86	5	5'-8"	17
W1	7	5	4'-8"	19
W2	14	4	8'-6"	14
W3	84	5	3'-6"	17



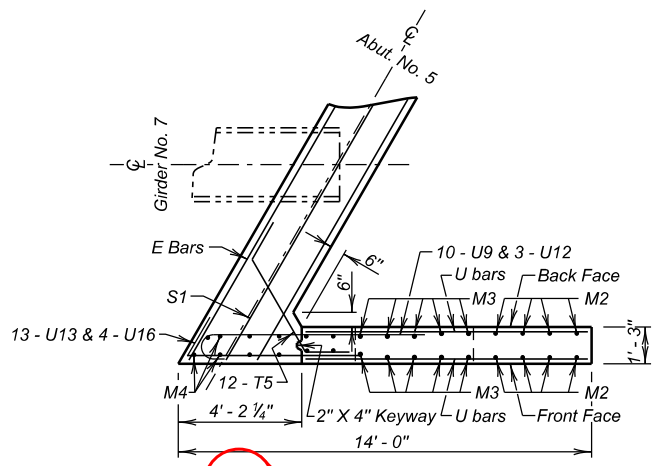
1 ABUTMENT NO. 5 DETAILS (C)
FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

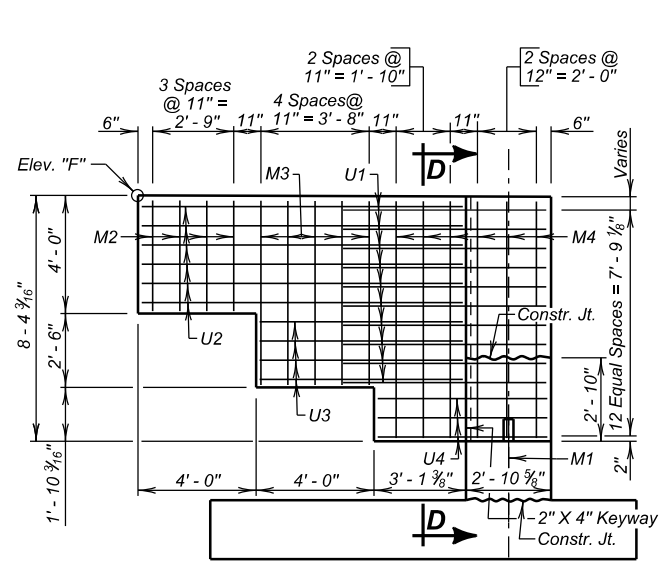
MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016



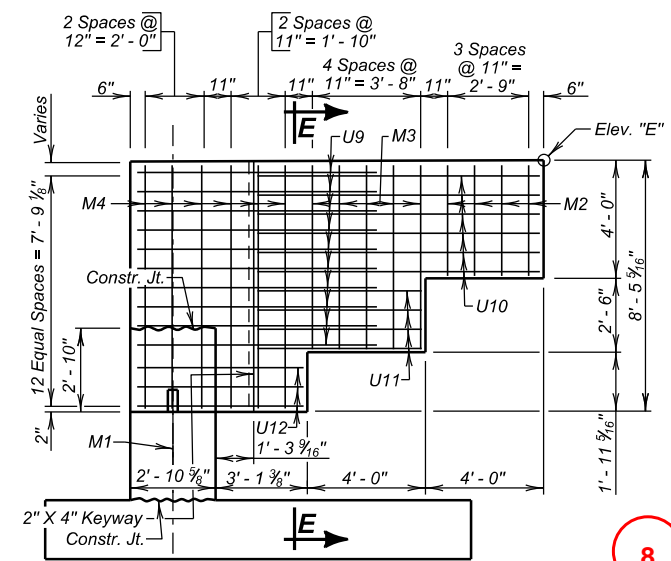
6 DETAIL "Z"



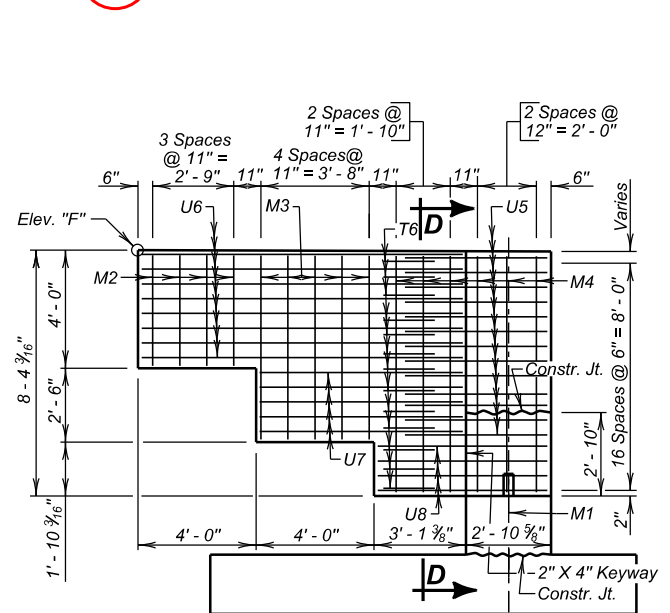
6 DETAIL "W"



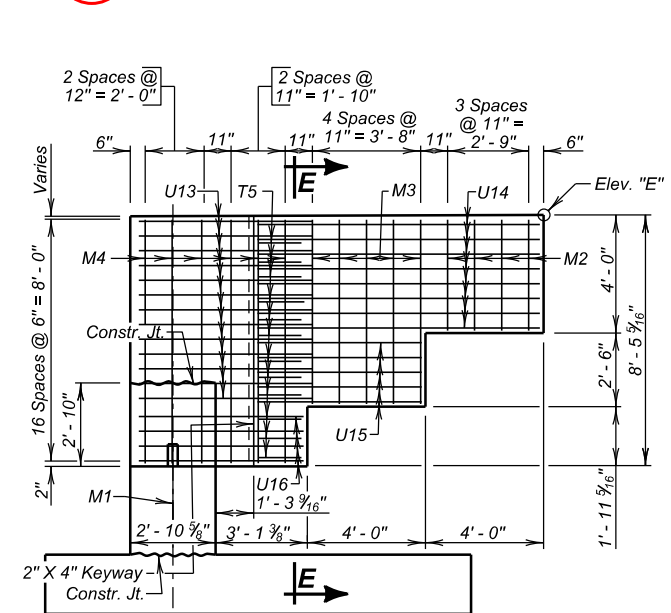
5 ELEVATION - BACK FACE



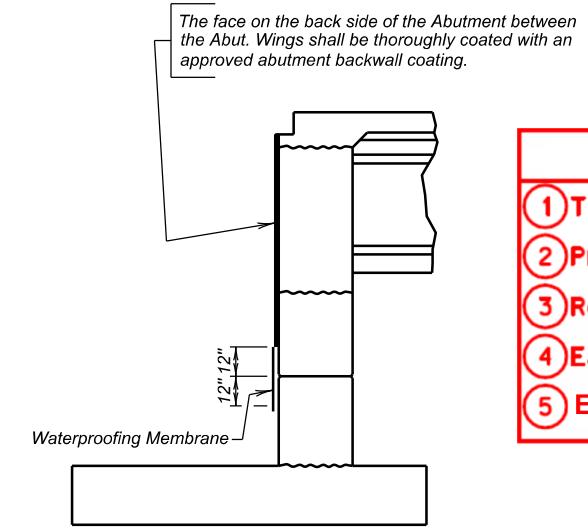
5 ELEVATION - BACK FACE



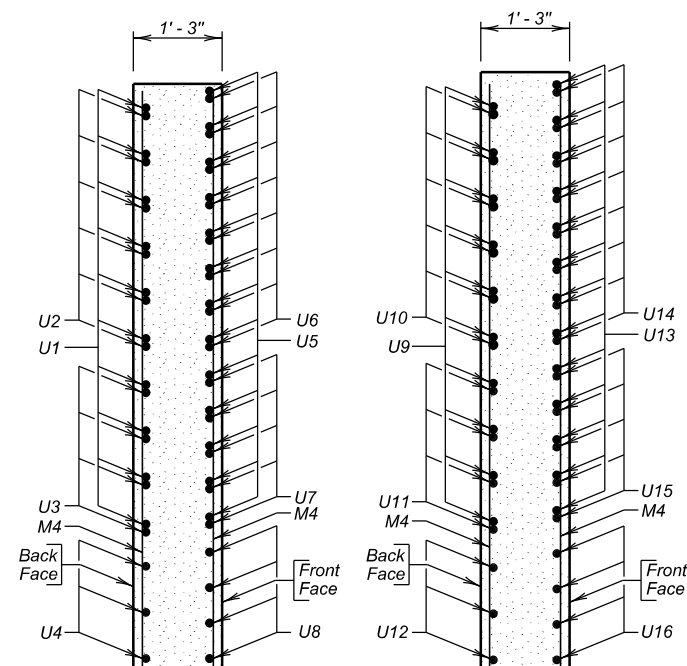
5 ELEVATION - FRONT FACE



5 ELEVATION - FRONT FACE



8 ABUTMENT BACKWALL COATING AND WATERPROOFING MEMBRANE DETAILS

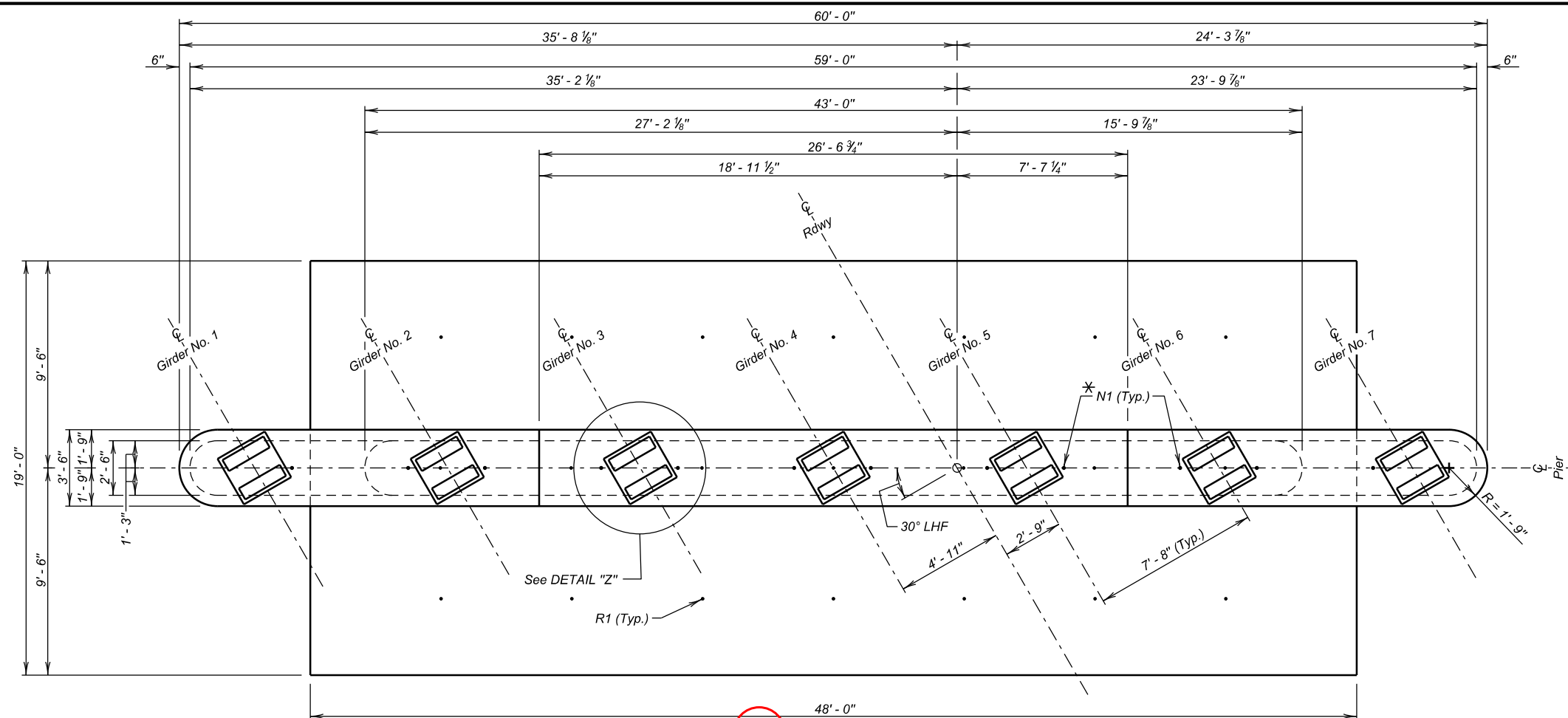


7 SEC. D - D

7 SEC. E - E

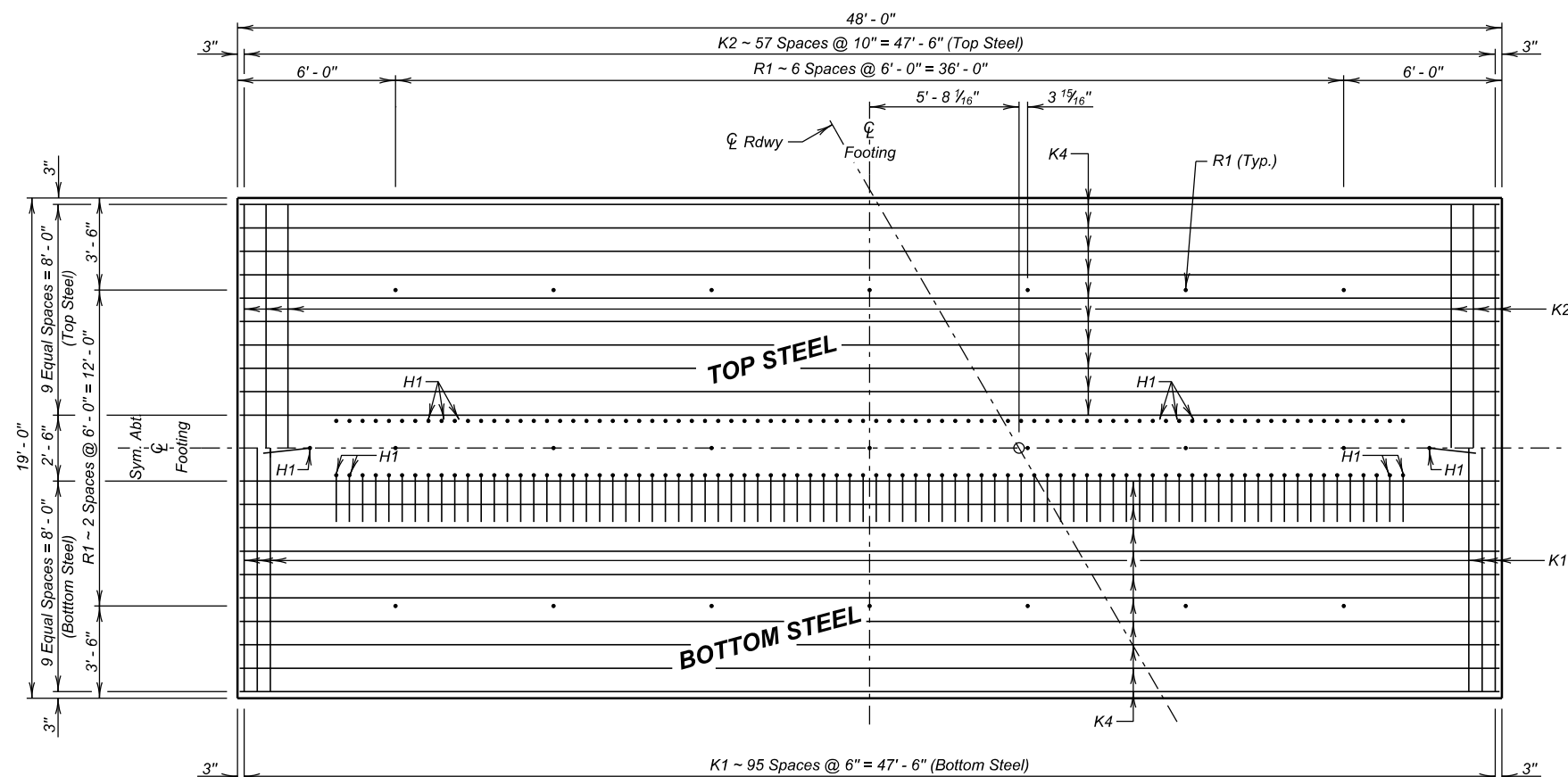


REQUIRED LIST	
① Title Block	④ Details as Required
② Project Block	
③ Plan View as Required	

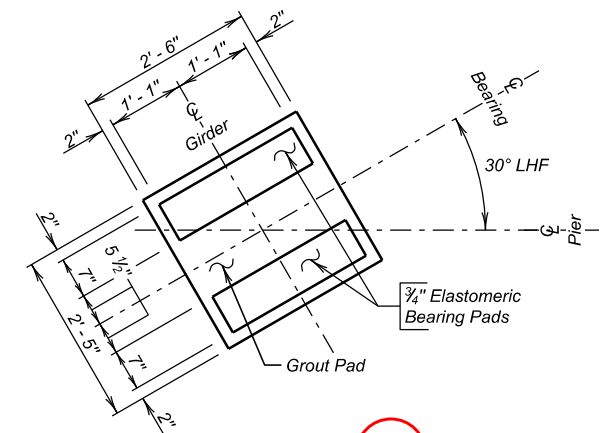


48' - 0"

3 PLAN



3 **PLAN**
(Footing Steel)



DETAIL "Z" 


1 PIER NO. 2 DETAILS (A)
FOR

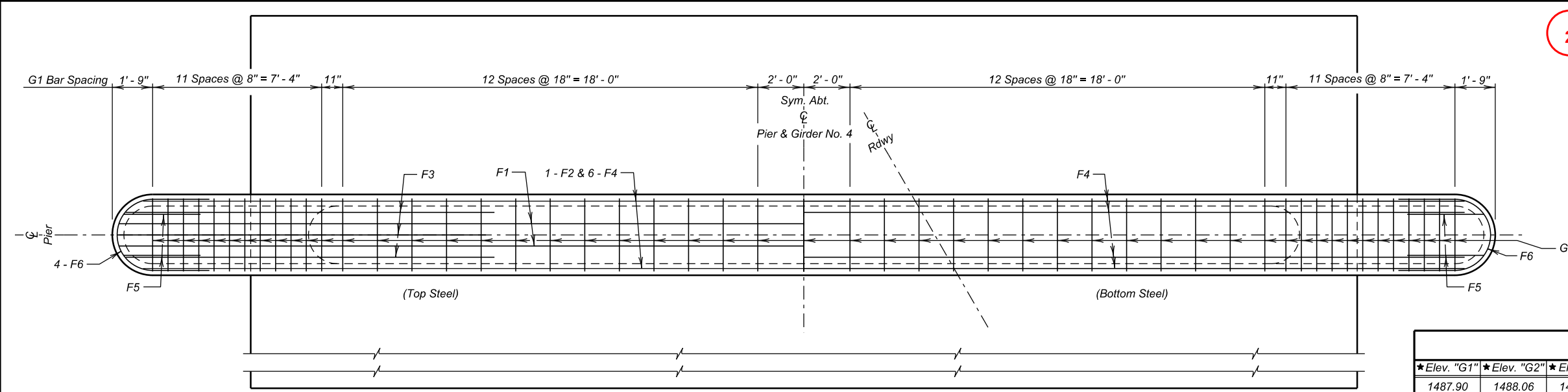
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION

APRIL 2016

16 OF 50

DESIGNED BY TD	CK. DES. BY BB	DRAFTED BY MG	 BRIDGE ENGINEER
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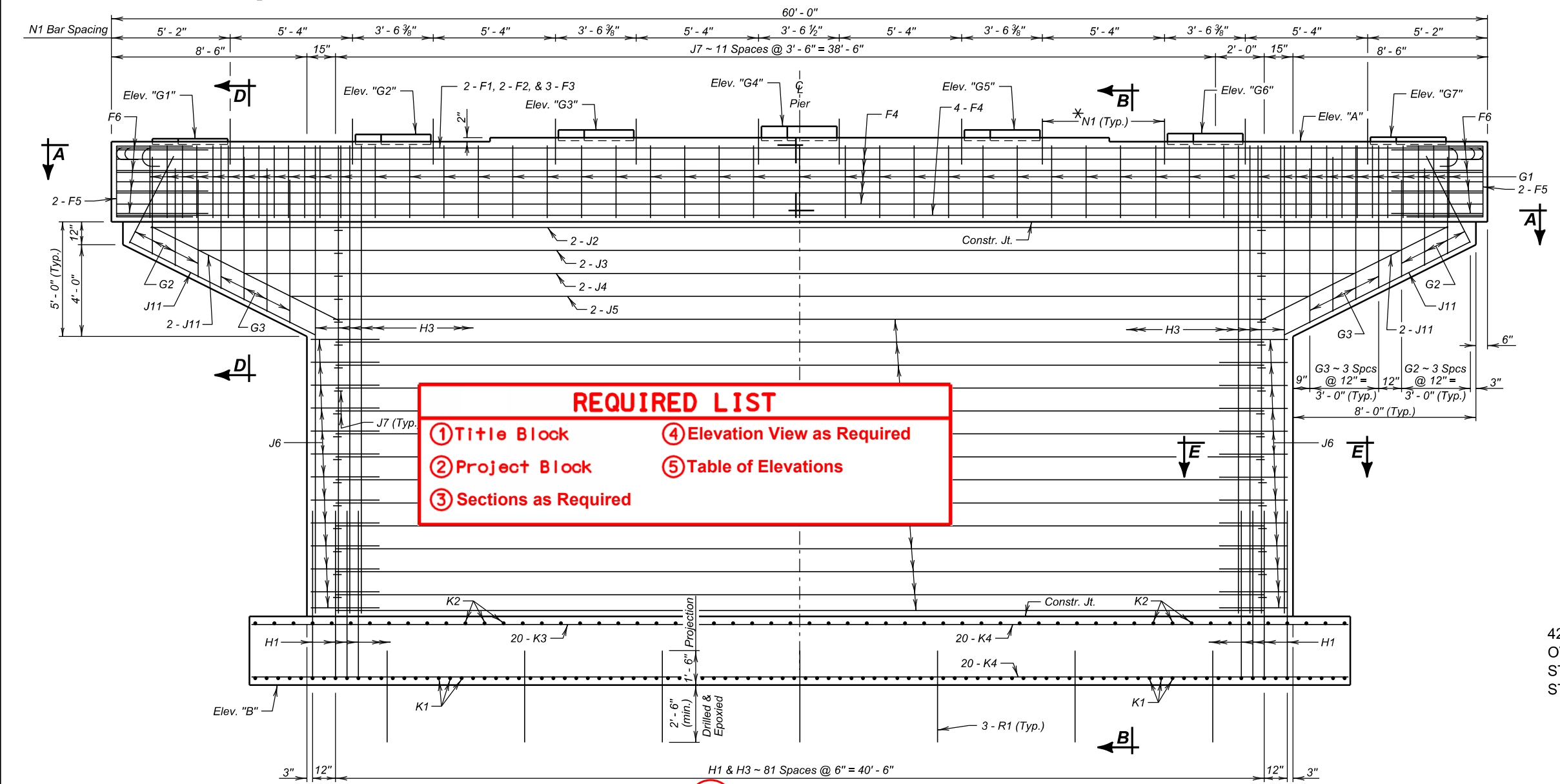
INCREASING STATIONS

3 SEC. A - A

* NOTE:
The portion of the N1 bar above the pier cap is to be coated with asphalt paint or wrapped with tar paper to a minimum thickness of 1/16". N1 bar may be shifted slightly off centerline of pier to avoid top mat of resteel.

TABLE OF ELEVATIONS								
★ Elev. "G1"	★ Elev. "G2"	★ Elev. "G3"	★ Elev. "G4"	★ Elev. "G5"	★ Elev. "G6"	★ Elev. "G7"	Elev. "A"	Elev. "B"
1487.90	1488.06	1488.23	1488.37	1488.23	1488.09	1487.95	1487.77	1464.00

NOTE: Top of Grout Pad shall be level and smooth.
★ Elevations are Top of Grout Pad at centerline of pier.



- REQUIRED LIST
- 1 Title Block

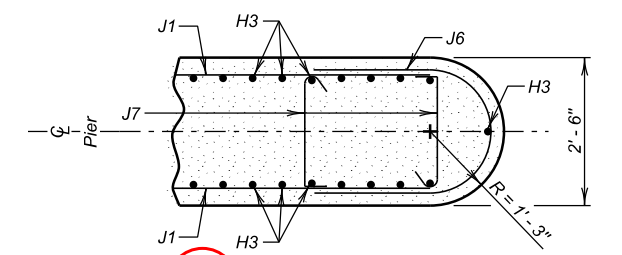
2 Project Block

3 Sections as Required

4 Elevation View as Required

5 Table of Elevations

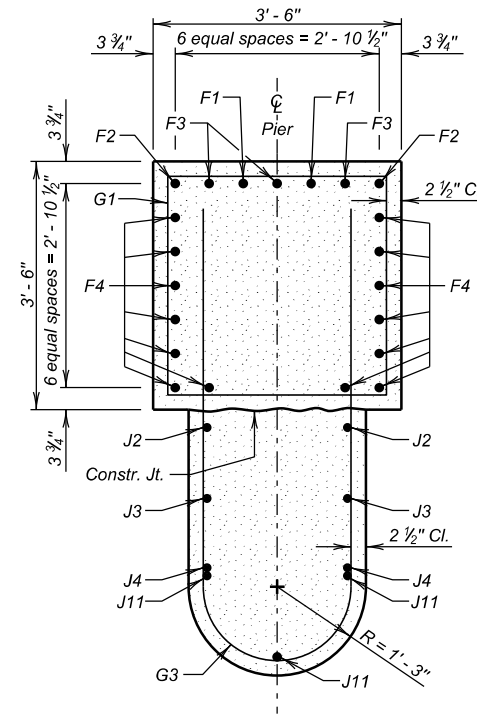
4 ELEVATION




3 SEC. E - E

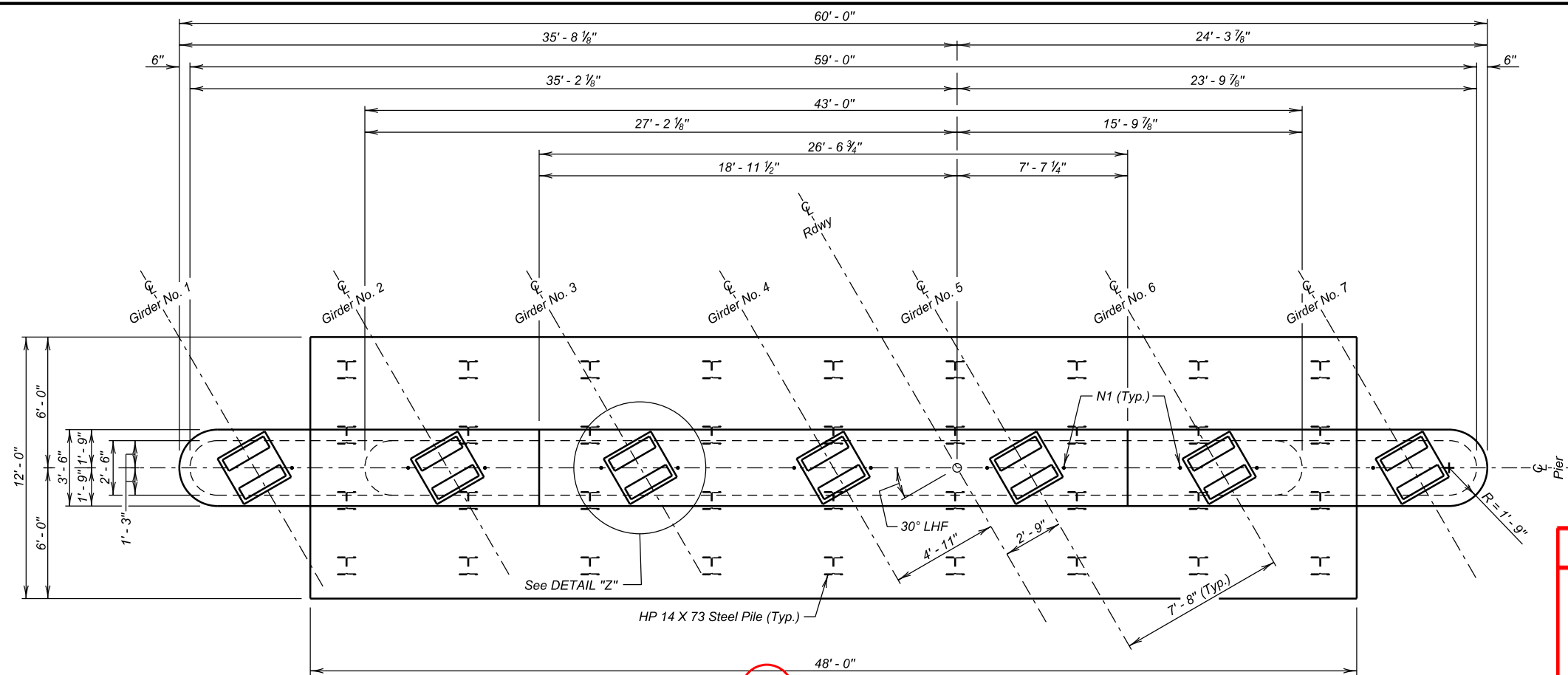
1 PIER NO. 2 DETAILS (B)
FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93



DESIGNED BY TD	CK. DES. BY BB	DRAFTED BY MG	 BRIDGE ENGINEER
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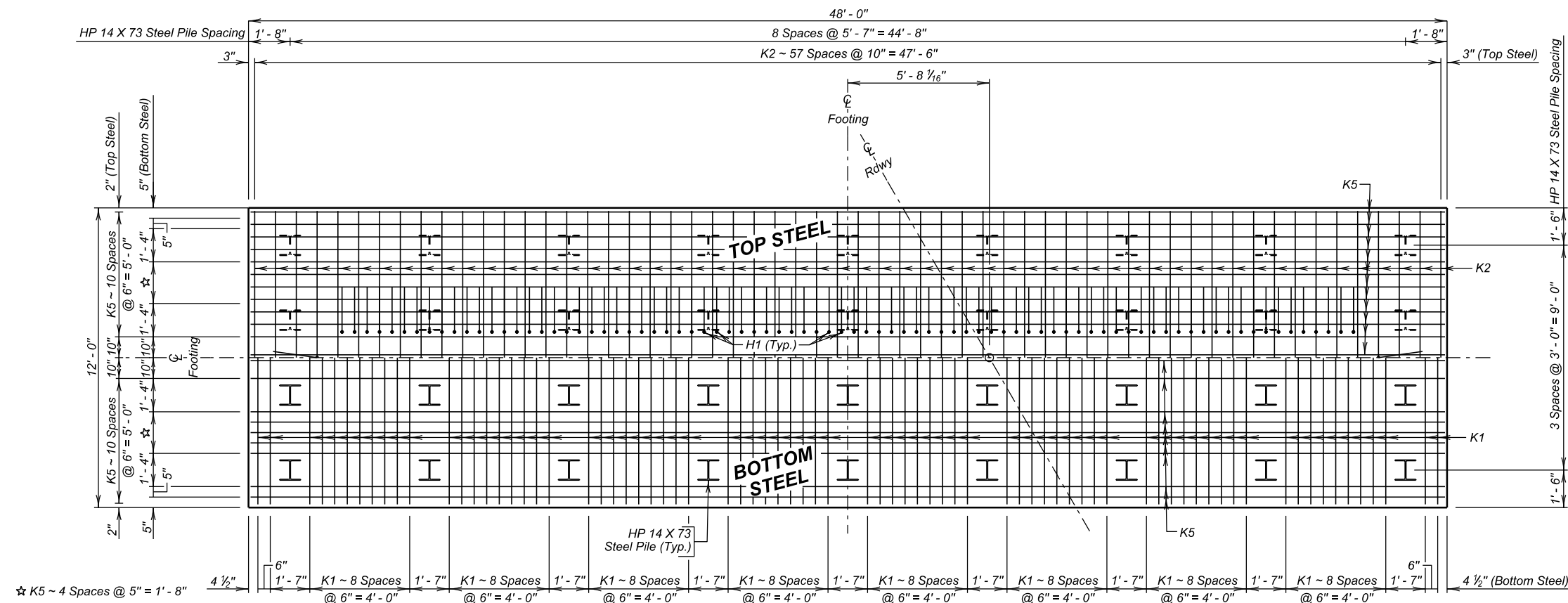
	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
	S.D.			



INCREASING STATIONS

REQUIRED LIST

- ① Title Block
 - ② Project Block
 - ③ Plan View as Required
 - ④ Details as Required



DETAIL "Z" ◀ 4

1 PIER NO. 3 DETAILS (A)
FOR

430' - 10 $\frac{5}{8}$ " PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2016

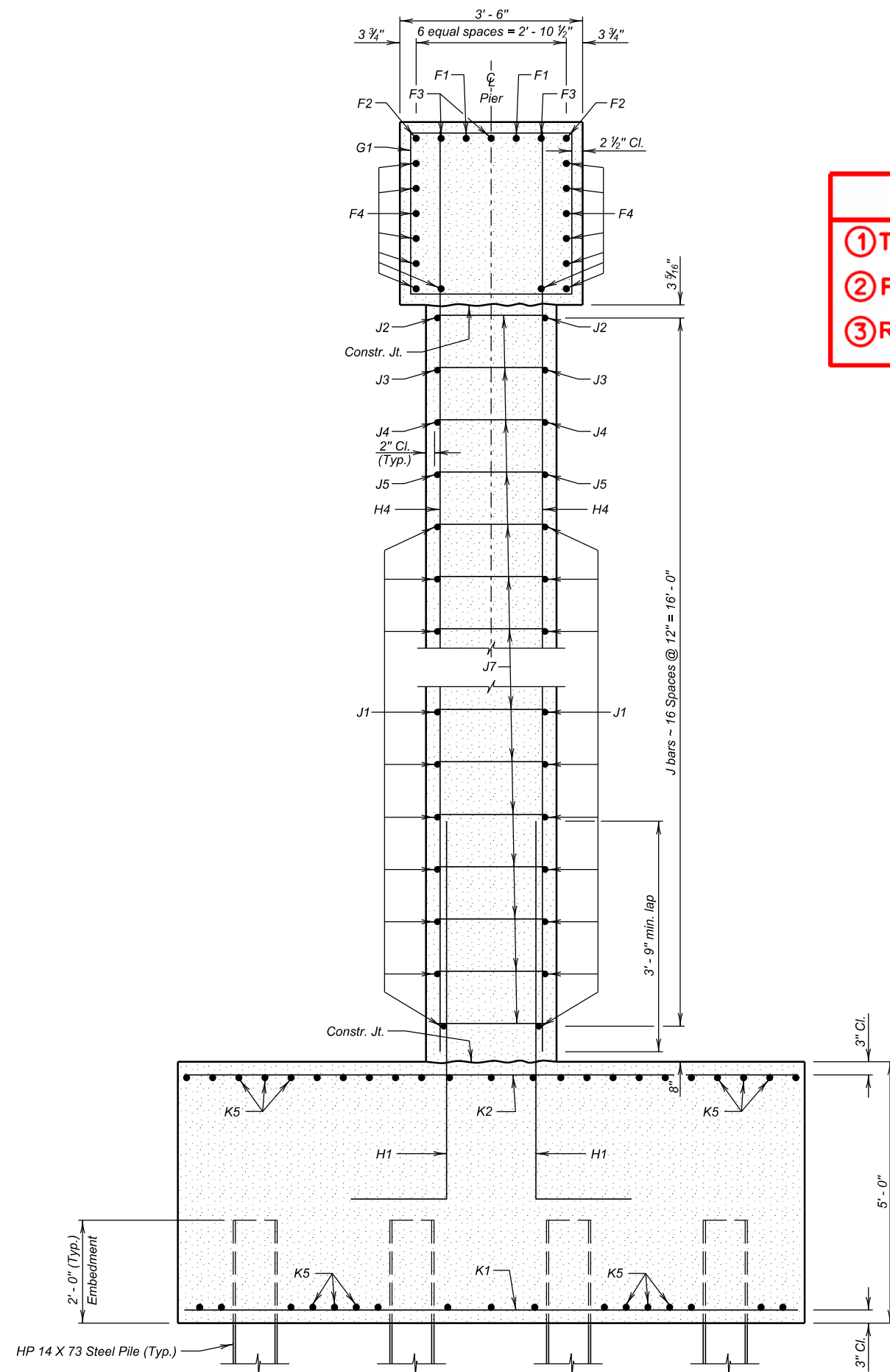
19) OF 50

DESIGNED BY
TD/PW

CK. DES. BY
BB

DRAFTED BY	
MG	

Steve A Johnson



REQUIRED LIST

- ① Title Block
 - ② Project Block
 - ③ Reinforcing Schedule
 - ④ Estimated Quantities
 - ⑤ Sections as Required

2	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
	S.D.			

REINFORCING SCHEDULE					Bending Details	
Mk.	No.	Size	Length	Type		
F1	2	9	59' - 5"	Str.		
F2	2	9	59' - 10"	1		
F3	6	8	16' - 11"	1A		
F4	14	5	57' - 4"	Str.		
F5	4	4	9' - 9"	17		
F6	8	4	9' - 9"	S11		
G1	51	5	13' - 4"	T2		
G2	8	5	9' - 8"	S11		
G3	8	5	13' - 8"	S11		
H1	166	10	9' - 3"	17A		
H4	166	10	20' - 1"	Str.		
J1	26	5	40' - 6"	Str.		
J2	2	5	56' - 4"	Str.		
J3	2	5	52' - 4"	Str.		
J4	2	5	48' - 4"	Str.		
J5	2	5	44' - 4"	Str.		
J6	24	5	7' - 3"	S11		
J7	221	4	2' - 10"	T9		
J11	6	5	9' - 1"	Str.		
K1	76	8	11' - 9"	Str.		
K2	58	5	11' - 9"	Str.		
K5	40	5	47' - 10"	Str.		
N1	12	8	2' - 0"	Str.		

NOTES-
All dimensions are out to out of bars.

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class A45 Concrete, Bridge	Cu. Yd.	199.8
Reinforcing Steel	Lb.	31184
Structure Excavation, Bridge	Cu. Yd.	270.2
HP 14 X 73 Steel Pile	Ft.	100


☐ Includes 0.4 Cu. Yds. for Grout Pads

1 PIER NO. 3 DETAILS (C)
FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK	30° LHF SKEW
OVER BIG SIOUX RIVER	SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63	P 0115(51)104
STR. NO. 50-206-020	HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

DESIGNED BY TD/PW	CK. DES. BY BB	DRAFTED BY MG	 BRIDGE ENGINEER
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3

REINFORCING SCHEDULE					
Mk.	No.	Size	Length	Type	Bending Details
F1	2	9	59' - 5"	Str.	
F2	2	9	59' - 10"	1	
F3	6	8	16' - 11"	1A	
F4	14	5	57' - 4"	Str.	
F5	4	4	9' - 9"	17	
F6	8	4	9' - 9"	S11	
G1	51	5	13' - 4"	T2	
G2	8	5	9' - 8"	S11	
G3	8	5	13' - 8"	S11	
H1	166	10	9' - 3"	17A	
H5	45	10	20' - 9"	Str.	
H6	40	10	18' - 9"	Str.	
H7	81	10	16' - 9"	Str.	
J1	20	5	40' - 6"	Str.	
J2	2	5	56' - 4"	Str.	
J3	2	5	52' - 4"	Str.	
J4	2	5	48' - 4"	Str.	
J5	2	5	44' - 4"	Str.	
J6	22	5	7' - 3"	S11	
J7	202	4	2' - 10"	T9	
J9	4	5	20' - 8"	Str.	
J10	4	5	10' - 8"	Str.	
J11	6	5	9' - 1"	Str.	
K1	96	8	18' - 10"	Str.	
K2	58	5	18' - 10"	Str.	
K6	40	5	14' - 3"	Str.	
K7	40	5	9' - 10"	Str.	
K8	40	5	23' - 4"	Str.	
N1	12	8	2' - 0"	Str.	
R1	21	11	4' - 0"	Str.	

NOTES-
All dimensions are out to out of bars.

4

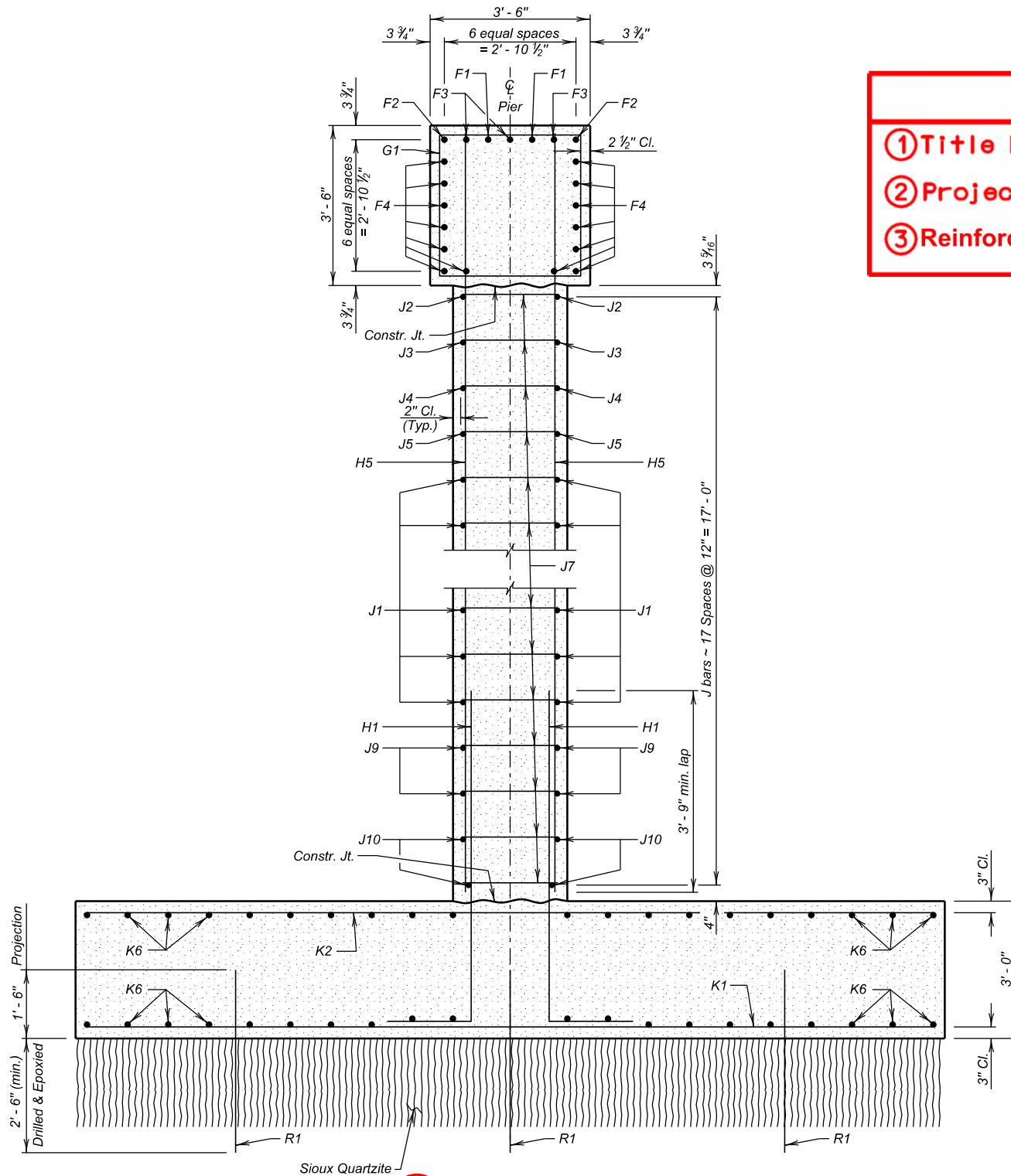
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Class A45 Concrete, Bridge	Cu. Yd.	193.0
Reinforcing Steel	Lb.	33048
Structure Excavation, Bridge	Cu. Yd.	270.5
Install Dowel in Rock	Ft.	52.5

Includes 0.4 Cu. Yds. for Grout Pads

1

PIER NO. 4 DETAILS (C)
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016



5

SEC. B - B

REQUIRED LIST

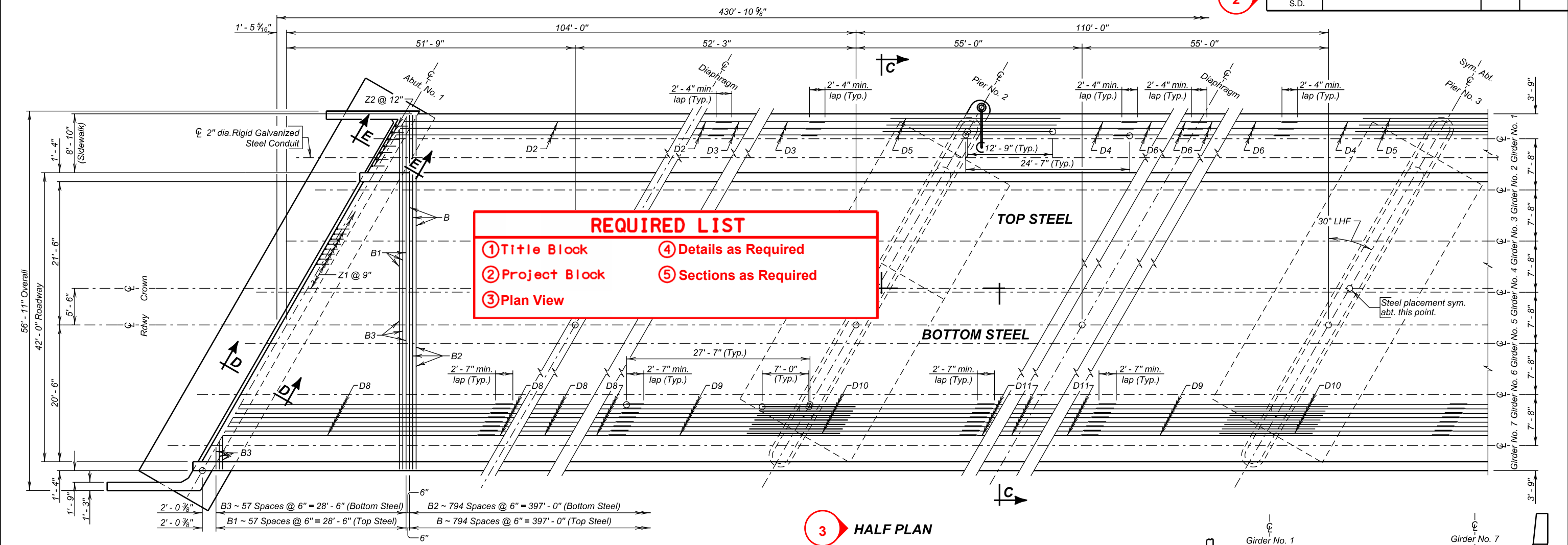
1 Title Block

2 Project Block

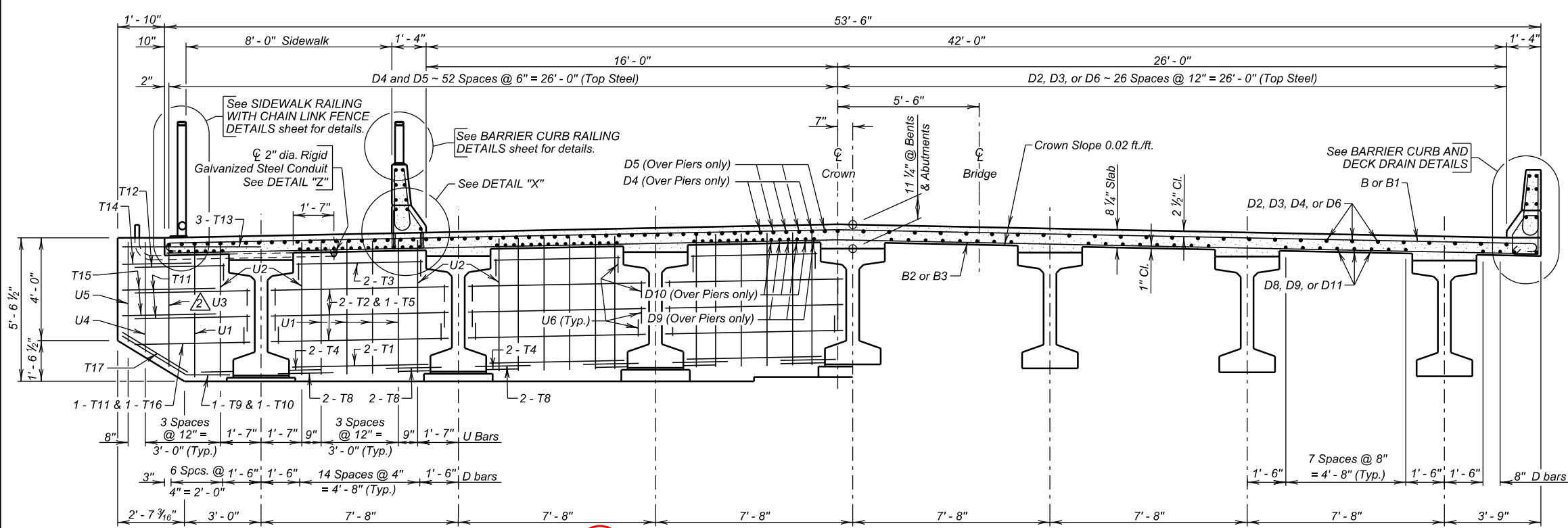
3 Reinforcing Schedule

4 Estimated Quantities

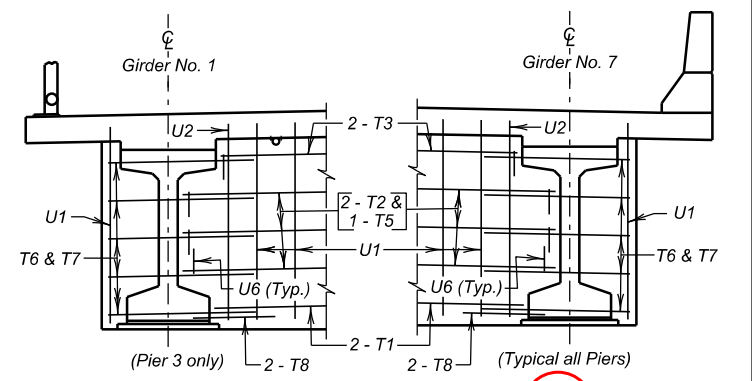
5 Sections as Required



3 HALF PLAN



5 SEC. C - C
(Midspan diaphragm not shown in this section, see DIAPHRAGM DETAILS.)



4 PIER DIAPHRAGMS

1 SUPERSTRUCTURE DETAILS (A)
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details	
∅	B	795	5	54'-6"	1	
∅	B1	58	5	57'-4"	1A	
	B2	795	4	53'-2"	Str.	
#	B3	58	4	56'-1"	Str.	
	B16	16	4	54'-10"	Str.	
★	C	216	5	1'-6"	Str.	
★	C0	432	5	1'-7"	19B	
	C1	432	5	5'-7"	T1A	
	C2	864	5	5'-2"	S11	
	D0	16	5	56'-0"	Str.	
	D1	128	4	55'-8"	Str.	
	D2	108	5	60'-0"	Str.	
	D3	108	6	24'-1"	Str.	
	D4	162	7	49'-2"	Str.	
	D5	156	7	25'-6"	Str.	
	D6	216	7	33'-11"	Str.	
	D8	208	5	40'-10"	Str.	
	D9	156	6	55'-2"	Str.	
	D10	138	7	14'-0"	Str.	
	D11	104	5	60'-0"	Str.	
*	T1	36	6	6'-0"	Str.	
*	T2	108	5	7'-11"	Str.	
*	T3	36	5	5'-6"	Str.	
*	T4	34	5	5'-0"	19C	
*	T5	9	6	56'-9"	Str.	
*	T6	20	5	6'-7"	19C	
*	T7	20	5	5'-0"	19C	
*	T8	36	6	2'-6"	Str.	
*	T9	2	4	4'-8"	Str.	
*	T10	2	4	3'-3"	Str.	
*	T11	6	4	4'-6"	Str.	
*	T12	2	6	3'-6"	Str.	
*	T13	6	6	6'-9"	Str.	
*	T14	2	4	9'-2"	S11	
*	T15	4	4	11'-6"	S11	
*	T16	2	4	3'-8"	Str.	
*	T17	2	4	7'-6"	S11	
*	U1	78	4	14'-10"	S4	
*	U2	38	6	15'-4"	S4	
*	U3	2	6	14'-9"	S4	
	U4	2	4	11'-5"	17	
	U5	2	4	10'-0"	17	
	U6	144	6	4'-5"	17	
	W7	55	4	7'-0"	17B	
	W8	55	4	5'-0"	17	
	Z1	112	7	2'-0"	Str.	
⊗	Z2	14	4	2'-0"	Str.	

NOTES -

∅ See cutting diagram.

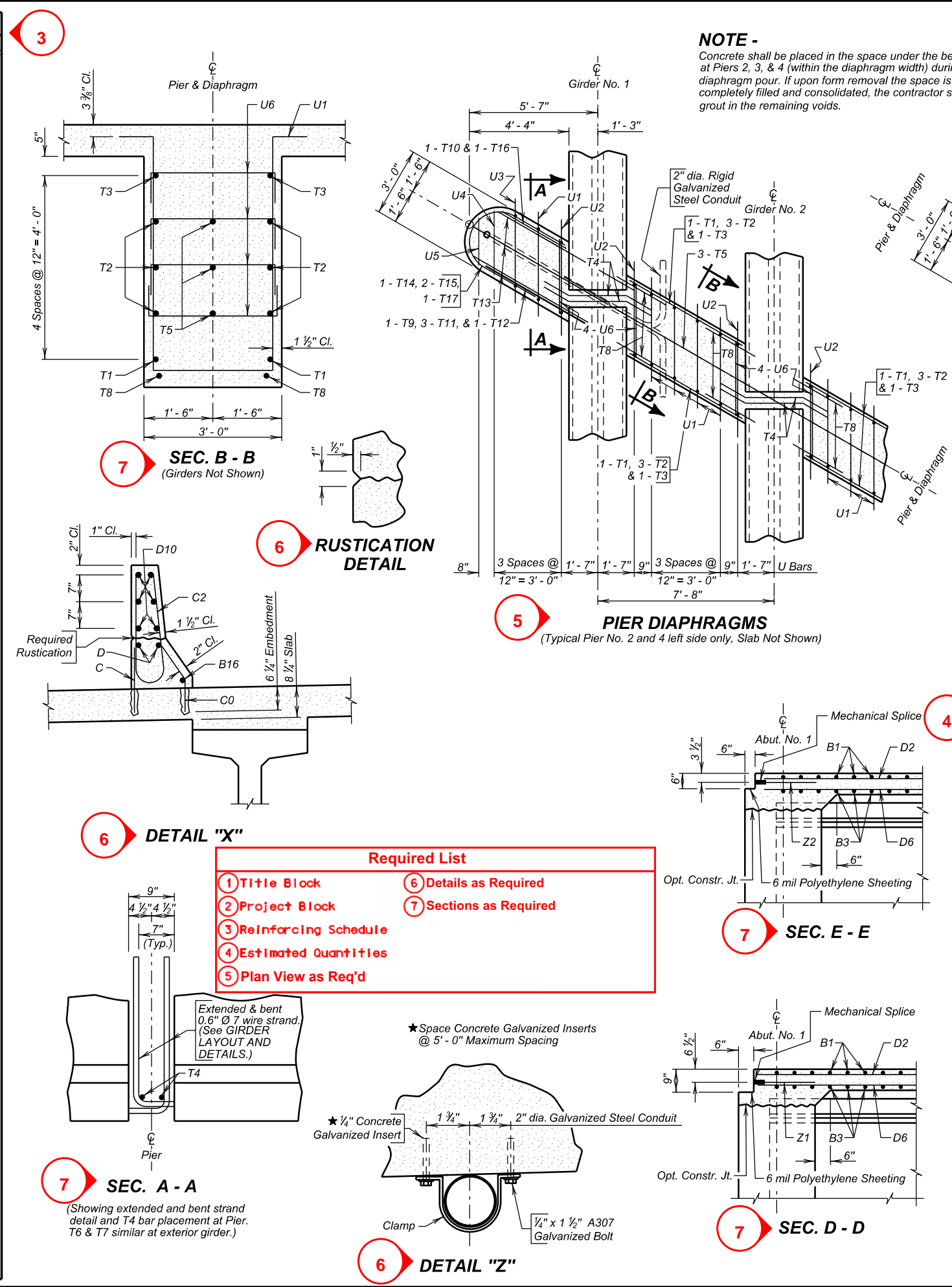
All reinforcing steel shall be epoxy coated except as noted.
See Approach Slab sheet for location of Z1 bars.
All dimensions are out to out of bars.

* Bars not to be epoxy coated.

∅ Tip bars as required to maintain top and bottom clear cover.

⊗ See SIDEWALK DETAILS for placement.

★ Drill and epoxy in place. Not included in reinforcing steel quantity.



STATE OF _____ PROJECT _____ SHEET NO. _____ TOTAL SHEETS _____

2

beams
ing the
not
hall

PIER DIAPHRAGMS
(Typical on right side of all Piers and Pier No. 3 left side, Slab Not Shown)

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
☆ Class A45 Concrete, Bridge Deck	Cu. Yd.	809.0
☆ Epoxy Coated Reinforcing Steel	Lb.	176774
Ø Reinforcing Steel	Lb.	4534
54" Minnesota Shape Prestressed Concrete Beam	Ft.	2982
Install Dowel in Concrete	Each	648
No. 4 Rebar Splice	Each	14
No. 7 Rebar Splice	Each	112
Concrete Penetrating Sealer	Sq. Yd.	2417.2

Ø Includes quantities for Pier Diaphragms, Barrier Curbs, and Slab.
☆ Includes quantities for Pier Diaphragms, Barrier Curbs, Slab and Haunch.
(Average depth of 2 ¼" used for Haunch Quantity.) Concrete Quantity for Barrier Curbs is 0.0836 Cu. Yd. / Ft. and for Tapered Barriers is 3.600 Cu. Yd. each.

1

**SUPERSTRUCTURE DETAILS (B)
FOR**

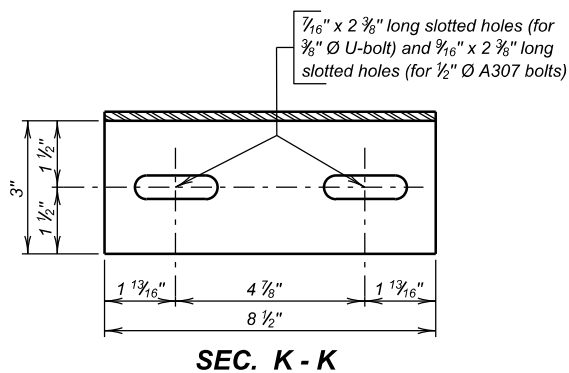
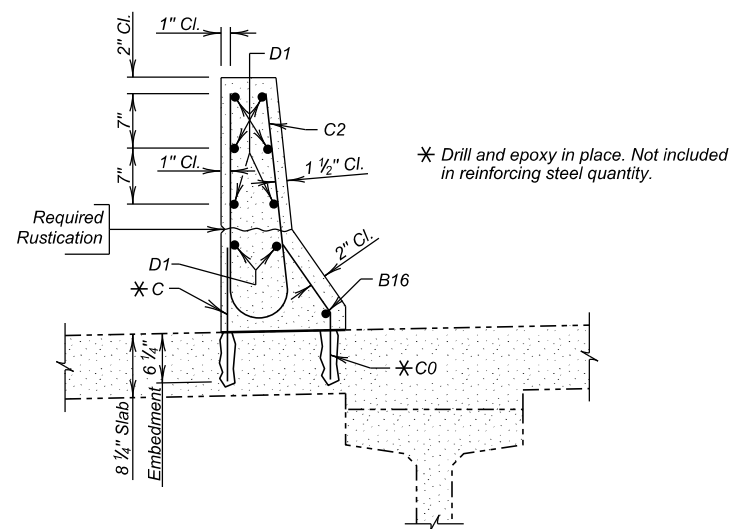
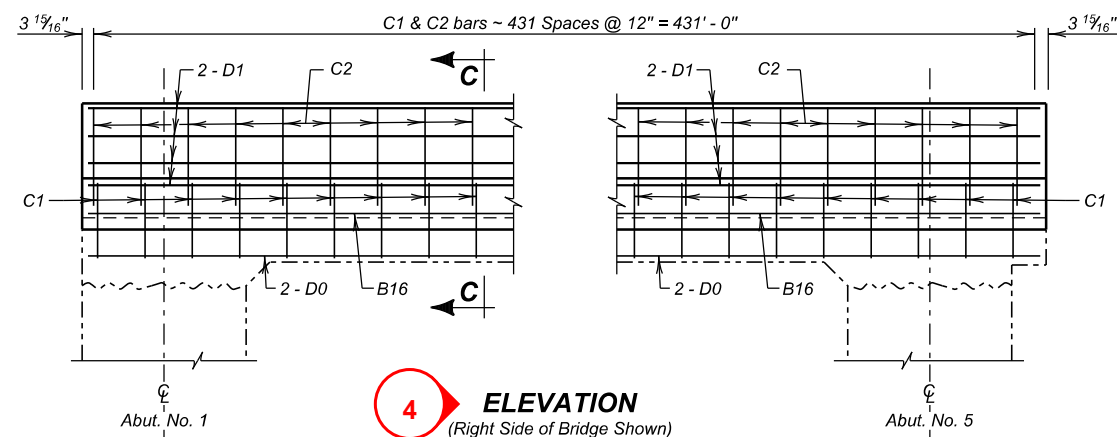
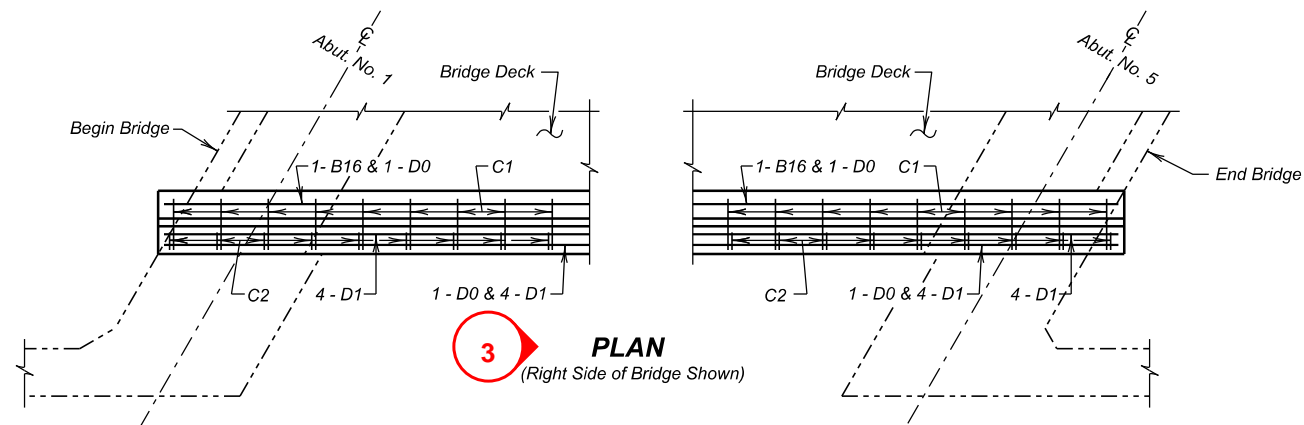
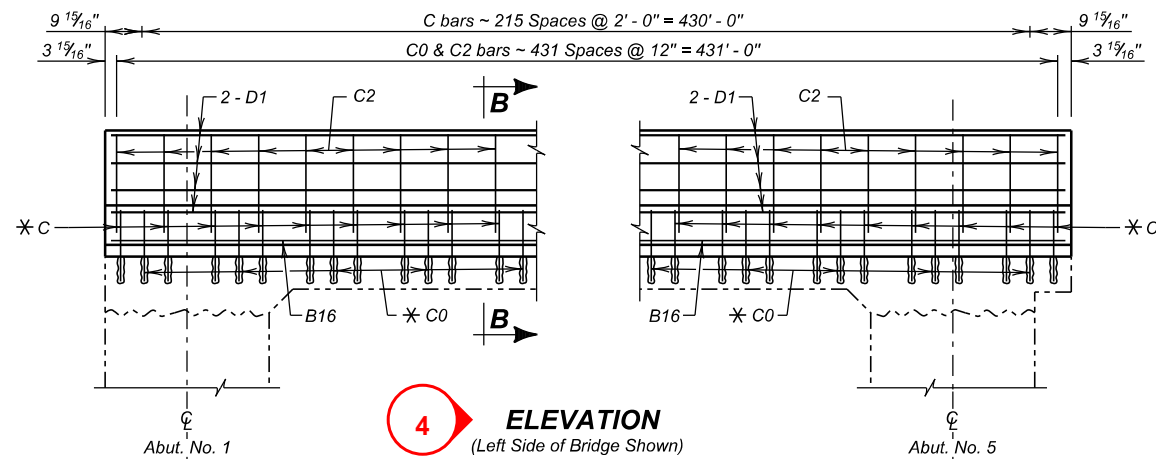
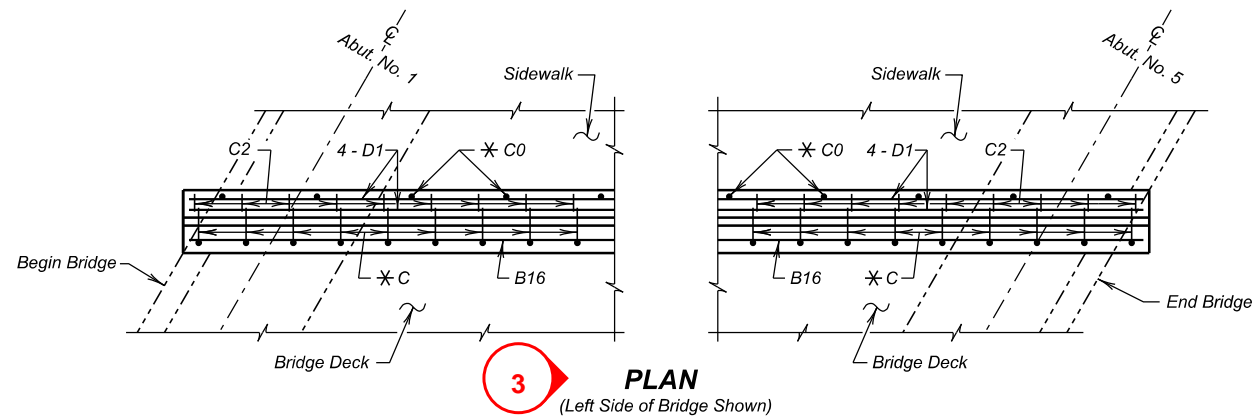
430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

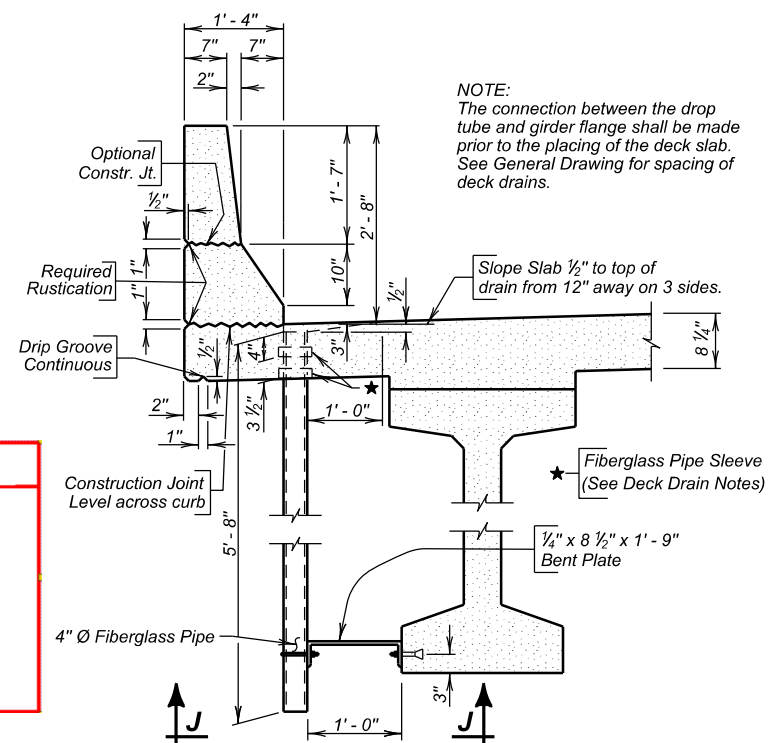
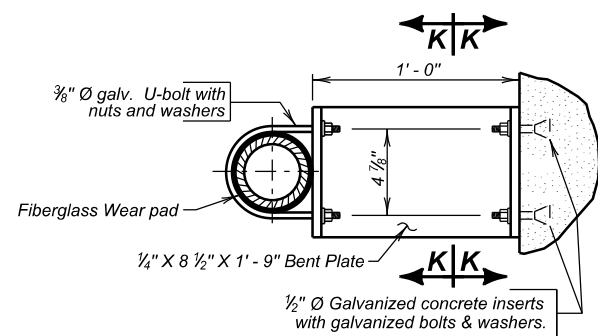
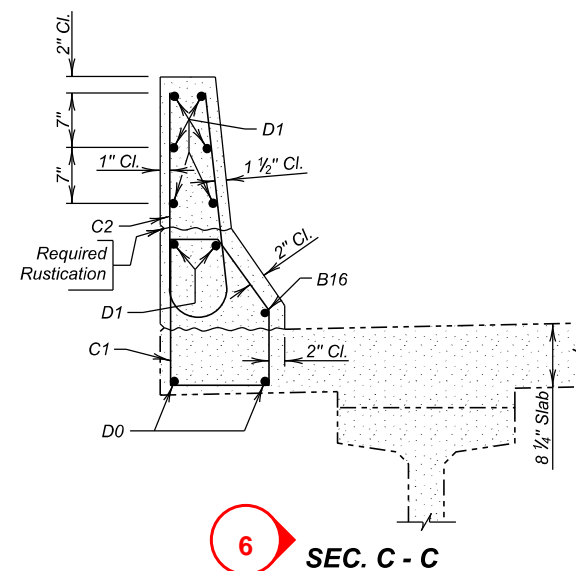
MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

DESIGNED BY BB	CK. DES. BY TD	DRAFTED BY BT	<i>Steve A Johnson</i> BRIDGE ENGINEER
-------------------	-------------------	------------------	---

(26) OF (50)



- Required List**
- 1 Title Block
 - 2 Project Block
 - 3 Plan View
 - 4 Elevation View
 - 5 Details as Required
 - 6 Sections as Required



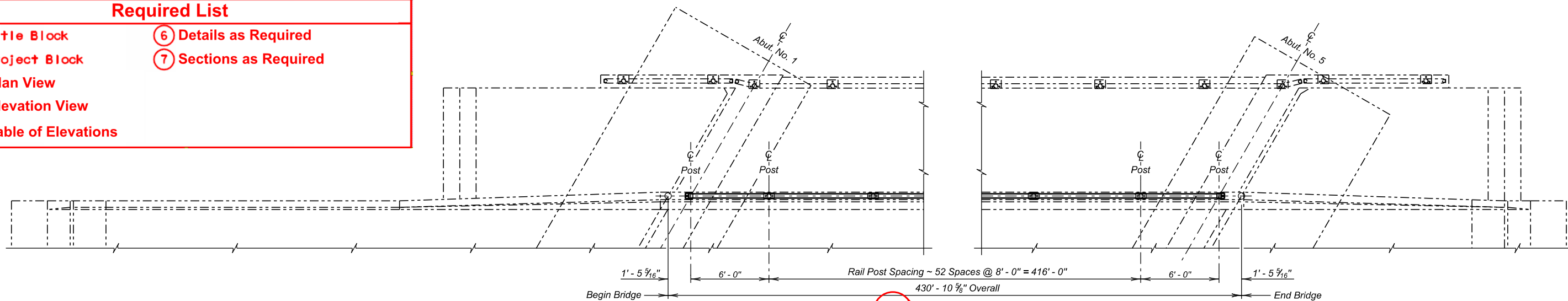
1 BARRIER CURB & DECK DRAIN DETAILS
FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

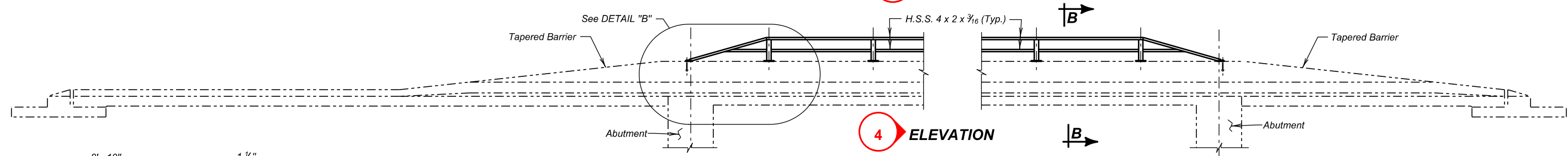
MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

Required List

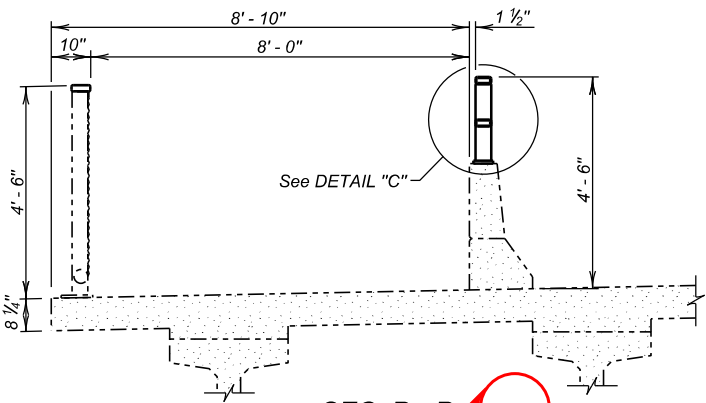
- 1 Title Block
- 2 Project Block
- 3 Plan View
- 4 Elevation View
- 5 Table of Elevations
- 6 Details as Required
- 7 Sections as Required



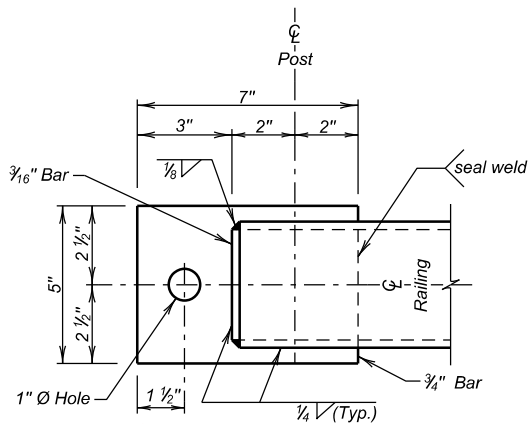
3 PLAN



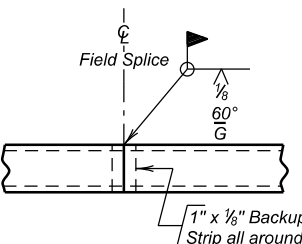
4 ELEVATION



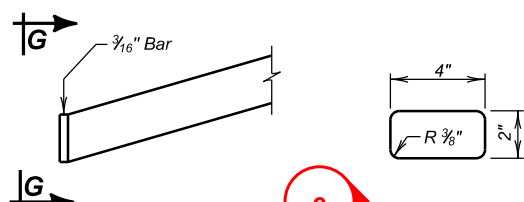
SEC. B - B



VIEW E - E



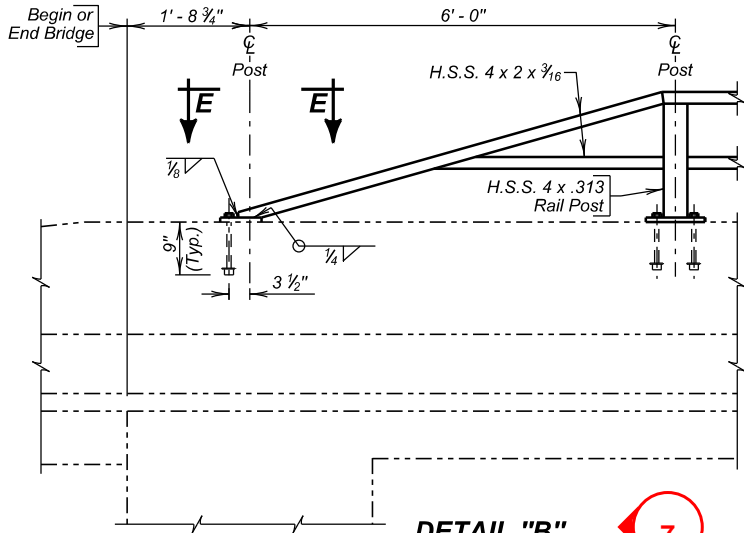
RAIL FIELD SPLICE



RAIL END CAP DETAIL

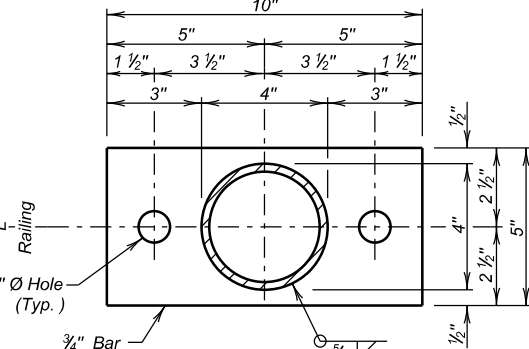
VIEW G - G

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Steel Pedestrian Railing on Concrete Barrier	Ft.	429.0

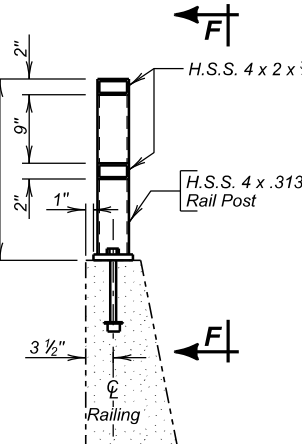


DETAIL "B"

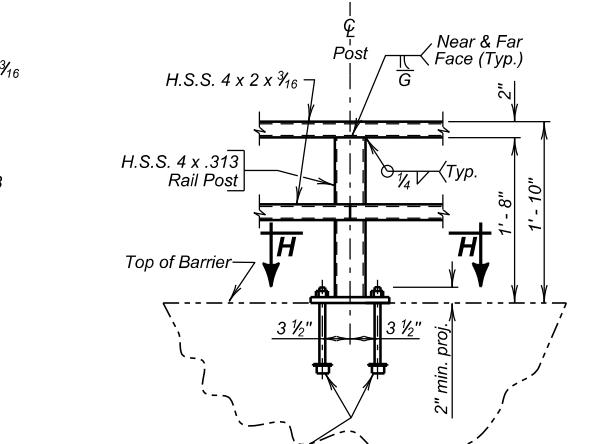
(Begin Bridge shown, End Bridge similar)



VIEW H - H



DETAIL "C"



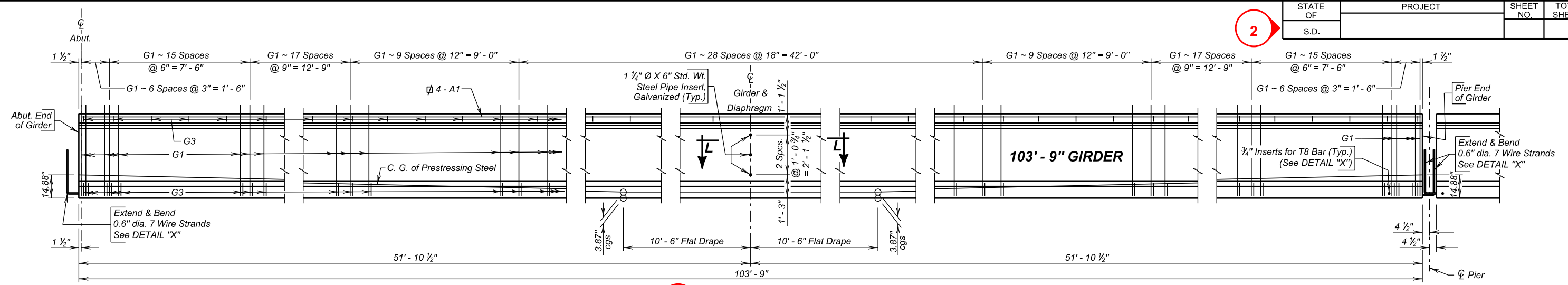
VIEW F - F

1 BARRIER CURB RAILING DETAILS FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016



4 ELEVATION

- REQUIRED LIST
- 1 Title Block

2 Project Block

3 Reinforcing Schedule

4 Elevation Views

5 Sections as Required

6 Stirrup Details

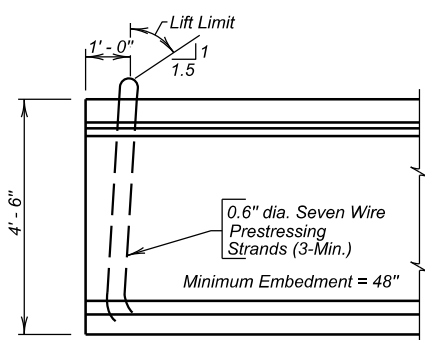
7 Girder Section Details

8 Extended Strand Details

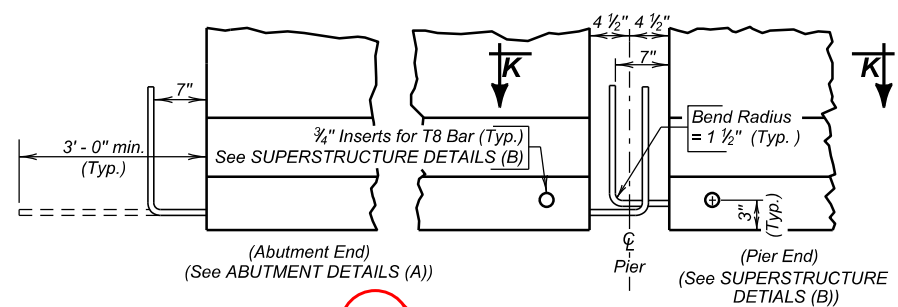
9 Girder Lifting Device

10 Threaded Inserts

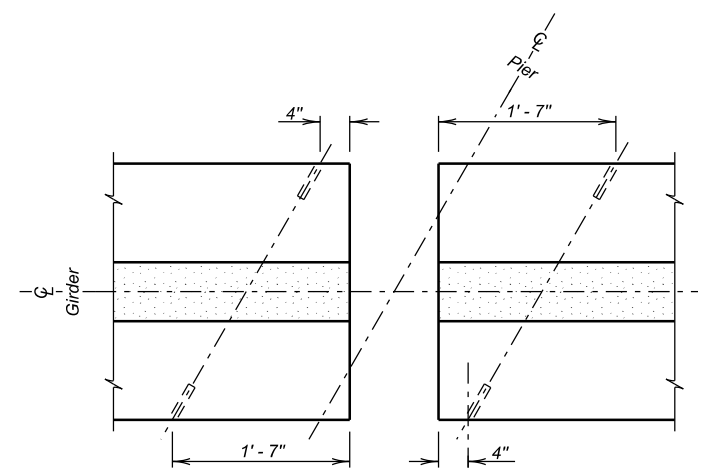
11 Midspan Inserts



9 TYPICAL LIFTING DEVICE



8 DETAIL "X"



10 SEC. K - K
Layout for inserts at beam ends (Pier only)

3

REINFORCING SCHEDULE
(For One Girder)

Mk.	No.	Size	Length	Type	Bending Details
A1	8	7	53'-6"	Str.	
G1	123	5	10'-0"	S11	
G2	123	4	4'-10"	S3A	
G3	52	4	2'-8"	17	

Type S11: 4" top bar, 4'-11" height, 11 1/2" bend radius, 12" vertical segment.

Type S3A: 2'-0" horizontal segment, 11 1/2" bend radius, 5 1/2" vertical segment.

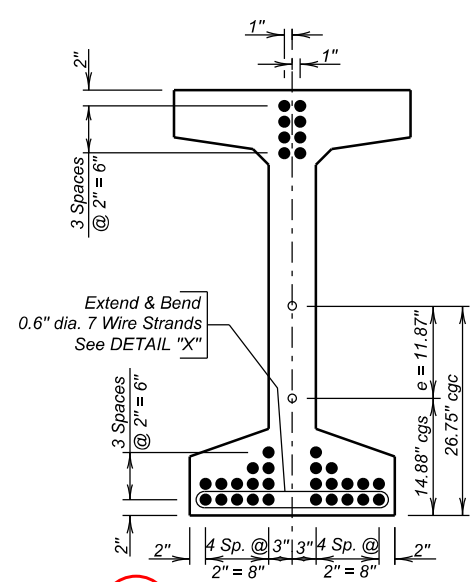
Type 17: 2'-2" horizontal segment, 3" vertical segment.

All dimensions are out to out of bars.

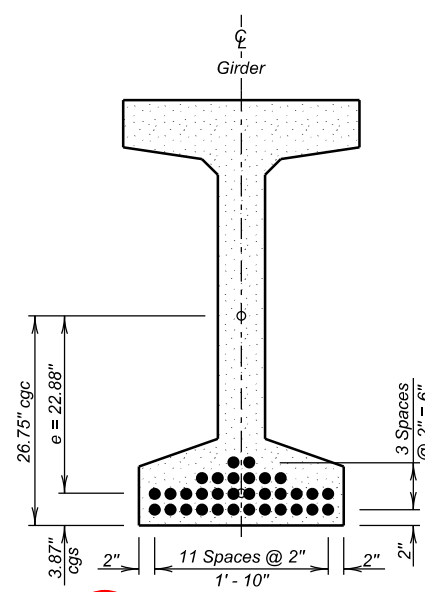
NOTE:
Cast in Concrete inserts are required in exterior girders at deck drain locations. See General Drawing and Barrier Curb and Deck Drain Details.

1

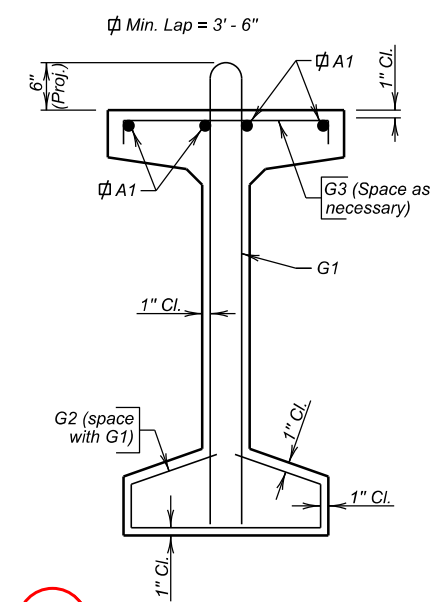
103' - 9" GIRDER DETAILS
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93



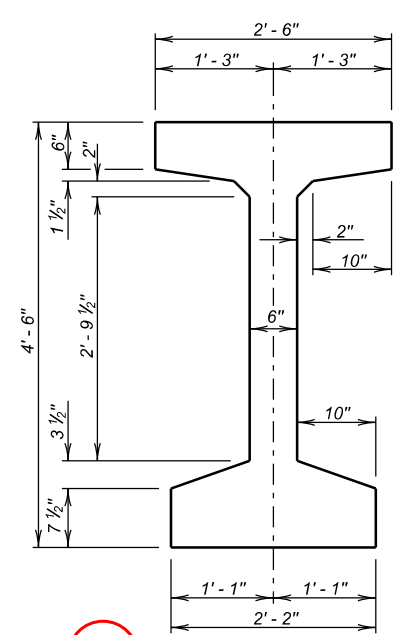
5 END SECTION



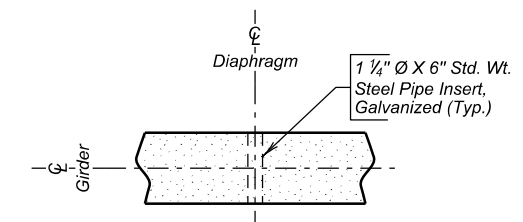
5 GIRDER SECTION
103' - 9" GIRDERS
(32 - 0.6 Dia. Type 270 Low Lax. Strands)



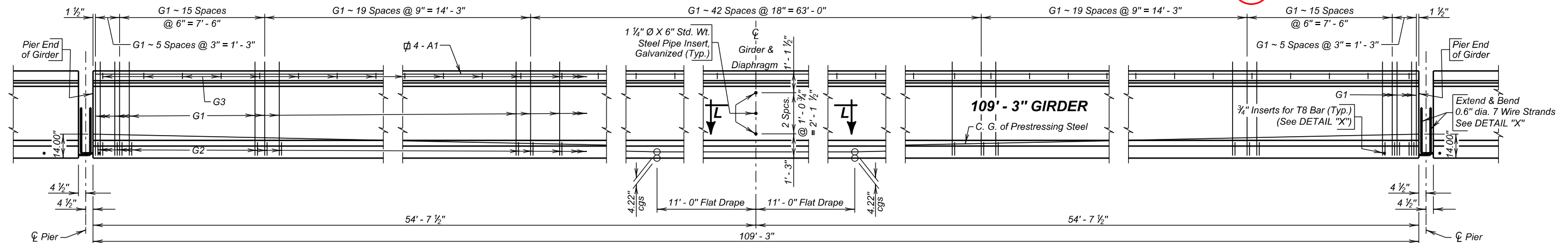
6 STIRRUP DETAILS



7 TYPE 54 GIRDER



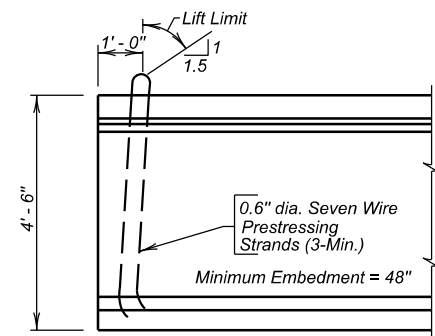
11 SEC. L - L



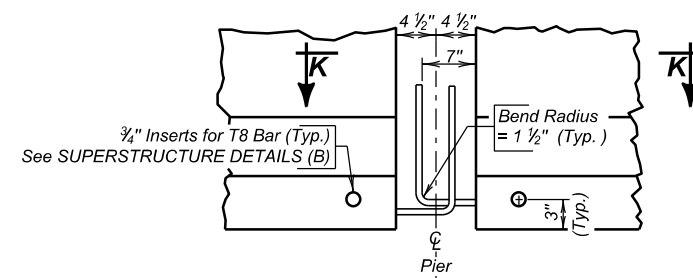
4 ELEVATION

REQUIRED LIST

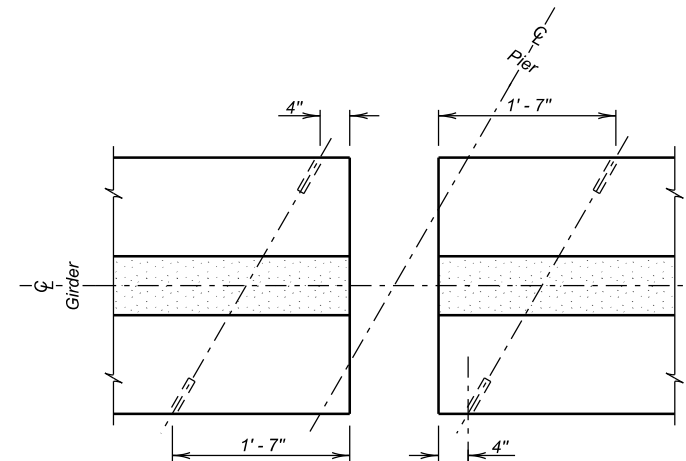
- | | | |
|------------------------|---------------------------|-------------------------|
| 1 Title Block | 5 Sections as Required | 9 Girder Lifting Device |
| 2 Project Block | 6 Stirrup Details | 10 Threaded Inserts |
| 3 Reinforcing Schedule | 7 Girder Section Details | 11 Midspan Inserts |
| 4 Elevation Views | 8 Extended Strand Details | |



9 TYPICAL LIFTING DEVICE



8 DETAIL "X"
(Pier End)



10 SEC. K - K
Layout for inserts at beam ends
(Pier only)

REINFORCING SCHEDULE (For One Girder)					
Mk.	No.	Size	Length	Type	Bending Details
A1	8	7	56' - 3"	Str.	
G1	121	4	10' - 0"	S11	
G2	121	4	4' - 10"	S3A	
G4	55	4	2' - 8"	17	

All dimensions are out to out of bars.

NOTE:
Cast in Concrete inserts are required in exterior girders
at deck drain locations. See General Drawing and
Barrier Curb and Deck Drain Details.

1 109' - 3" GIRDER DETAILS

FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE

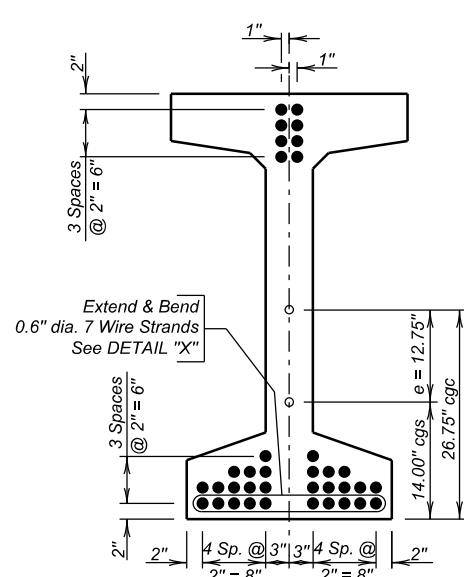
42' - 0" ROADWAY & 8' - 0" SIDEWALK	30° LHF SKEW
OVER BIG SIOUX RIVER	SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63	P 0115(51)104
STR. NO. 50-206-020	HL-93

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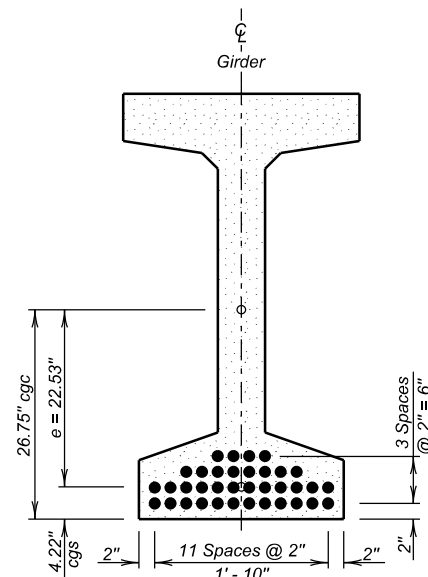
APRIL 2016

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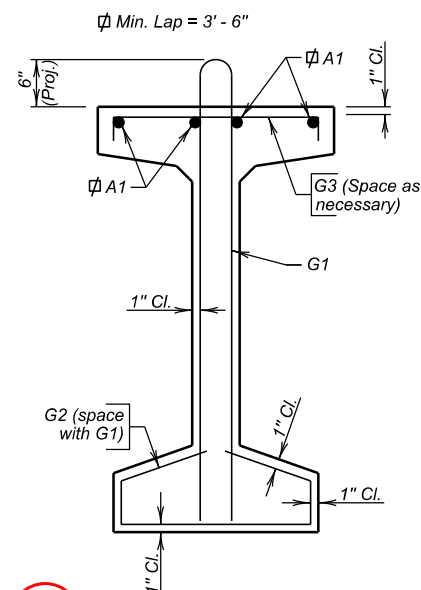
DESIGNED BY BB	CK. DES. BY TD	DRAFTED BY BT	Steve A. Johnson BRIDGE ENGINEER
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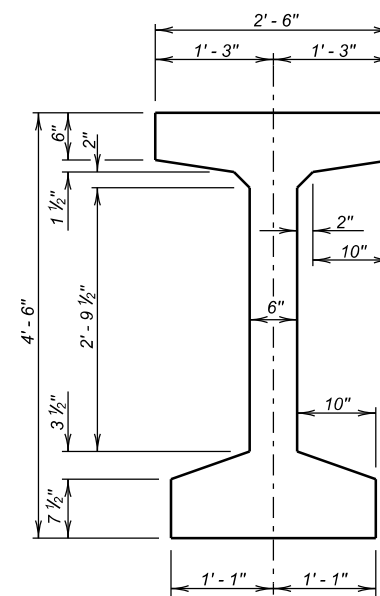
5 END SECTION



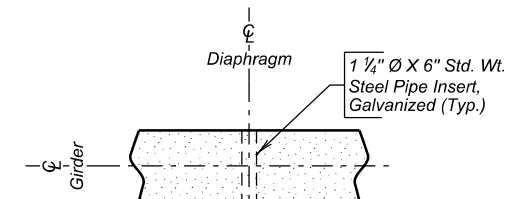
5 GIRDER SECTION



6 STIRRUP DETAILS



7 TYPE 54 GIRDER

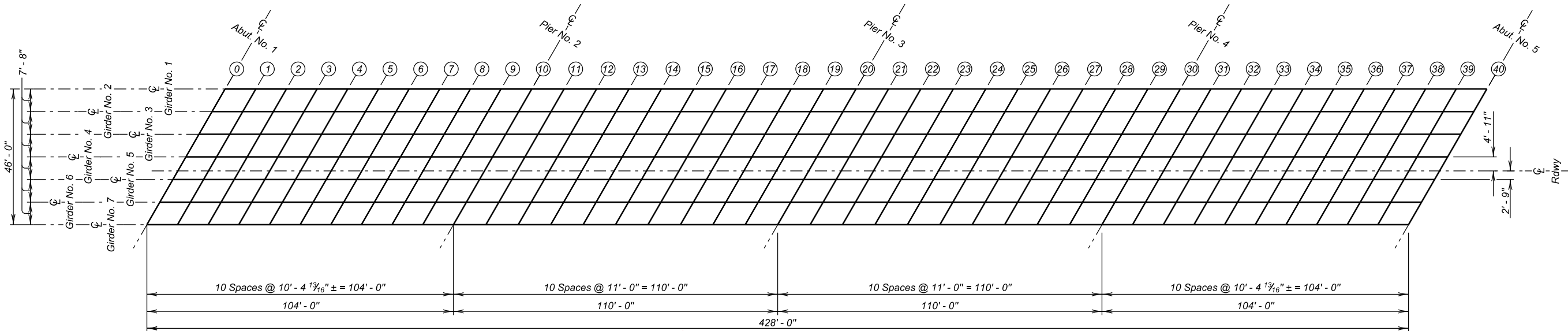


11 SEC. L - L

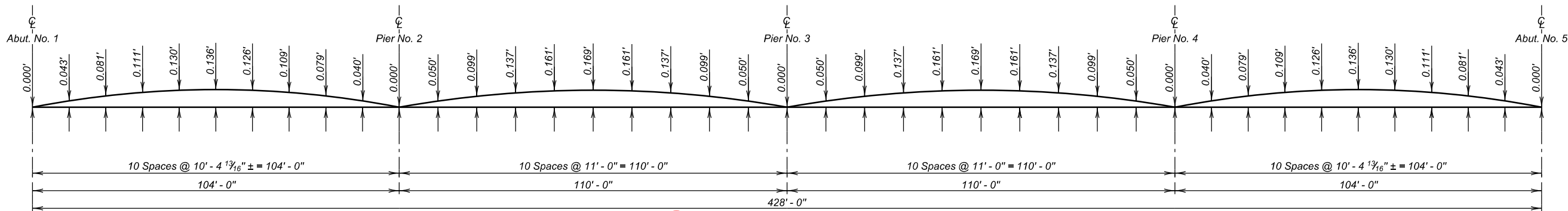
109' - 3" GIRDERS
(36 ~ 0.6 Dia. Type 270 Low Lax. Strands)

2

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			



3 GIRDER LAYOUT



4 CAMBER DIAGRAM

The Camber shown is the amount which has been added to the theoretical slab elevations to get slab elevations shown in the table of Slab Form Elevations and Calculations. Camber shown is for D. L. of slab, traffic barrier, and haunch, but does not include D. L. of beams.

REQUIRED LIST

1 Title Block

4 Camber Diagram

2 Project Block

3 Plan View

1 ERECTION DATA AND SLAB FORM ELEVATIONS (A)

FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

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DESIGNED BY BB	CK. DES. BY TD	DRAFTED BY BT	Steve A. Johnson BRIDGE ENGINEER
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4

TABLE OF SLAB FORM ELEVATIONS AND CALCULATIONS																						
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Girder No. 1	Elev. "M"	1493.709	1493.721	1493.727	1493.726	1493.714	1493.689	1493.648	1493.599	1493.538	1493.468	1493.397	1493.414	1493.430	1493.435	1493.426	1493.401	1493.360	1493.303	1493.232	1493.150	1493.067
	(-) Elev. "N"																					
	(=) d																					
	(-) 0. 688"																					
	(=) h																					
Girder No. 2	Elev. "M"	1493.875	1493.887	1493.894	1493.893	1493.881	1493.855	1493.814	1493.766	1493.705	1493.635	1493.563	1493.580	1493.596	1493.601	1493.592	1493.567	1493.526	1493.469	1493.398	1493.316	1493.233
	(-) Elev. "N"																					
	(=) d																					
	(-) 0. 688"																					
	(=) h																					
Girder No. 3	Elev. "M"	1494.042	1494.054	1494.061	1494.059	1494.047	1494.022	1493.981	1493.933	1493.871	1493.801	1493.730	1493.747	1493.763	1493.768	1493.759	1493.734	1493.693	1493.636	1493.565	1493.483	1493.400
	(-) Elev. "N"																					
	(=) d																					
	(-) 0. 688"																					
	(=) h																					
Girder No. 4	Elev. "M"	1494.185	1494.197	1494.204	1494.203	1494.190	1494.165	1494.124	1494.076	1494.015	1493.944	1493.873	1493.890	1493.906	1493.911	1493.902	1493.877	1493.836	1493.779	1493.708	1493.626	1493.543
	(-) Elev. "N"																					
	(=) d																					
	(-) 0. 688"																					
	(=) h																					
Girder No. 5	Elev. "M"	1494.045	1494.057	1494.064	1494.063	1494.050	1494.025	1493.984	1493.936	1493.875	1493.804	1493.733	1493.750	1493.766	1493.771	1493.762	1493.737	1493.696	1493.639	1493.568	1493.486	1493.403
	(-) Elev. "N"																					
	(=) d																					
	(-) 0. 688"																					
	(=) h																					
Girder No. 6	Elev. "M"	1493.905	1493.917	1493.924	1493.923	1493.910	1493.885	1493.844	1493.796	1493.735	1493.664	1493.593	1493.610	1493.626	1493.631	1493.622	1493.597	1493.556	1493.499	1493.428	1493.346	1493.263
	(-) Elev. "N"																					
	(=) d																					
	(-) 0. 688"																					
	(=) h																					
Girder No. 7	Elev. "M"	1493.765	1493.777	1493.784	1493.783	1493.770	1493.745	1493.704	1493.656	1493.595	1493.524	1493.453	1493.470	1493.486	1493.491	1493.482	1493.457	1493.416	1493.359	1493.288	1493.206	1493.123
	(-) Elev. "N"																					
	(=) d																					
	(-) 0. 688"																					
	(=) h																					

4

TABLE OF SLAB FORM ELEVATIONS AND CALCULATIONS																					
		21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Girder No. 1	Elev. "M"	1493.084	1493.100	1493.105	1493.096	1493.071	1493.030	1492.973	1492.902	1492.820	1492.737	1492.746	1492.753	1492.752	1492.738	1492.717	1492.680	1492.629	1492.568	1492.499	1492.425
	(-) Elev. "N"																				
	(=) d																				
	(-) 0. 688'																				
	(=) h																				
Girder No. 2	Elev. "M"	1493.250	1493.266	1493.271	1493.262	1493.237	1493.196	1493.139	1493.068	1492.986	1492.903	1492.912	1492.920	1492.919	1492.905	1492.883	1492.846	1492.796	1492.735	1492.666	1492.591
	(-) Elev. "N"																				
	(=) d																				
	(-) 0. 688'																				
	(=) h																				
Girder No. 3	Elev. "M"	1493.417	1493.433	1493.438	1493.429	1493.404	1493.363	1493.306	1493.235	1493.153	1493.070	1493.079	1493.087	1493.085	1493.071	1493.050	1493.013	1492.963	1492.901	1492.832	1492.758
	(-) Elev. "N"																				
	(=) d																				
	(-) 0. 688'																				
	(=) h																				
Girder No. 4	Elev. "M"	1493.560	1493.576	1493.581	1493.572	1493.547	1493.506	1493.449	1493.378	1493.296	1493.213	1493.222	1493.230	1493.229	1493.214	1493.193	1493.156	1493.106	1493.045	1492.975	1492.901
	(-) Elev. "N"																				
	(=) d																				
	(-) 0. 688'																				
	(=) h																				
Girder No. 5	Elev. "M"	1493.420	1493.436	1493.441	1493.432	1493.407	1493.366	1493.309	1493.238	1493.156	1493.073	1493.082	1493.090	1493.089	1493.074	1493.053	1493.016	1492.966	1492.905	1492.835	1492.761
	(-) Elev. "N"																				
	(=) d																				
	(-) 0. 688'																				
	(=) h																				
Girder No. 6	Elev. "M"	1493.280	1493.296	1493.301	1493.292	1493.267	1493.226	1493.169	1493.098	1493.016	1492.933	1492.942	1492.950	1492.949	1492.934	1492.913	1492.876	1492.826	1492.765	1492.695	1492.621
	(-) Elev. "N"																				
	(=) d																				
	(-) 0. 688'																				
	(=) h																				
Girder No. 7	Elev. "M"	1493.140	1493.156	1493.161	1493.152	1493.127	1493.086	1493.029	1492.958	1492.876	1492.793	1492.802	1492.810	1492.809	1492.794	1492.773	1492.736	1492.686	1492.625	1492.555	1492.481
	(-) Elev. "N"																				
	(=) d																				
	(-) 0. 688'																				
	(=) h																				

2

STATE OF
S.D.

PROJECT

SHEET NO.

TOTAL SHEETS

NOTE —

Based on a "d" of 11 ¼" at the C of each abutment and 11 ¼" at the C of the Piers (see SEC. C - C on SUPERSTRUCTURE DETAILS (A), it is anticipated that the midspan haunch dimension "h" over the C of each girder will be 1 ¼". If when computing the dimensions in the table, it is found that any dimension "h" is less than zero or greater than 4" the Office of Bridge Design of the South Dakota Dept. of Transportation shall be notified immediately. After the "Table of Slab Form Elevations and Calculations" has been completely filled out and approved for deck forming, a copy shall be forwarded to the Office of Bridge Design for review and analysis for the purpose of securing information relative to camber growth in the beams. This information is necessary for preparing plans for future structures of this type.

NOTE —

The table contains the information necessary to determine the depth of concrete over the girders at points shown. Calculations may be carried in the spaces provided. Elev. "M" is the design elevation of the top of slab before any concrete has been poured. This elevation includes correction for camber and dead load deflection. Elev. "N" is a field measured elevation taken on top of girders at the points shown with the girders in their positions. This elevation must be taken after erection is completed, but prior to placing any of the concrete. Girders shall not be supported between bearings when elevations are taken.

3

Slab

Girder

* Varies with crown

Elev. "M" (See Note)

Elev. "N" (See Note)

- REQUIRED LIST
- 1

Title Block
- 2

Project Block
- 3

Haunch Detail and Notes
- 4

Elevation Calculations Table

1

ERECTION DATA AND SLAB FORM ELEVATIONS (B)

FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW

OVER BIG SIOUX RIVER SEC. 9-T104N-R49W

STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104

STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY

S. D. DEPT. OF TRANSPORTATION

APRIL 2016

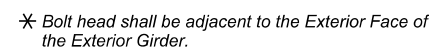
33 OF 50

DESIGNED BY
BB

CK. DES. BY
TD

DRAFTED BY
BT

Steve A. Johnson
BRIDGE ENGINEER



- ① Title Block
- ② Project Block
- ③ Fill out Remainder of Standard Base Sheet



DIAPHRAGM SUPPORT PLATE

1. *All steel for the diaphragms including plate washers shall conform to ASTM A36 and shall be galvanized in accordance with ASTM A123 or A153. A307 Bolts and hardware shall be galvanized in accordance with ASTM F2329. Direct Tension Indicators shall conform to Section 410 of the Specifications.*
2. *The steel diaphragms between adjacent girders shall be installed as soon as possible and in conjunction with girder erection.*
3. *All costs associated with furnishing, fabricating, assembly and installation of diaphragms shall be included in the lump sum price for Structural Steel, Miscellaneous.*

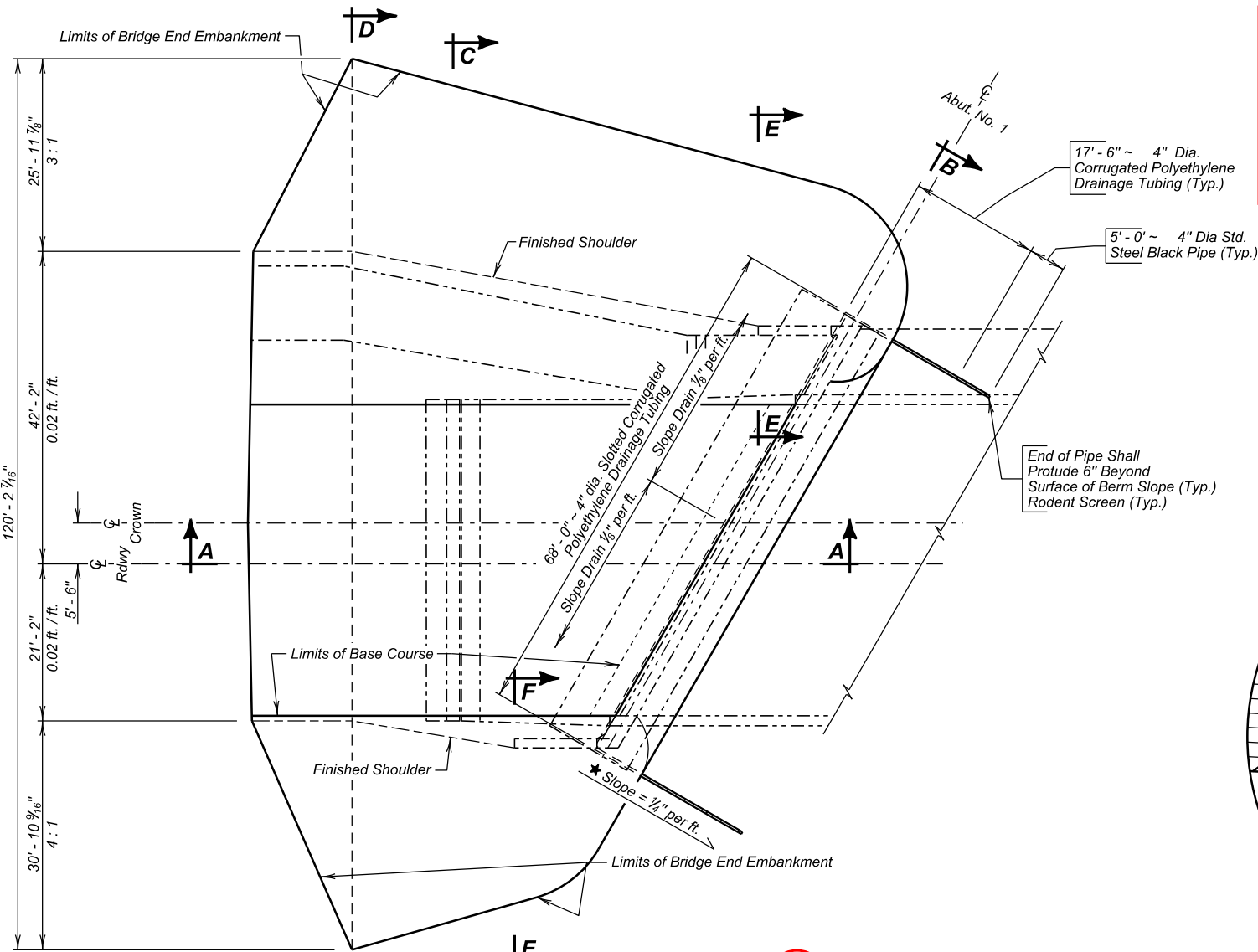
ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Δ Structural Steel, Miscellaneous	L.S.	Lump Sum

Δ Structural Steel, Miscellaneous	L.S.	Lump Sum
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Δ For informational purposes only, the estimated weight of structural steel is 11275 Lbs. for 24 diaphragms.

430' - 10 5/8" PRESTR. GIRDER BRIDGE
2' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
VER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
TR. NO. 50-206-020 HL-93

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S. D. DEPT. OF TRANSPORTATION
APRIL 2016 34

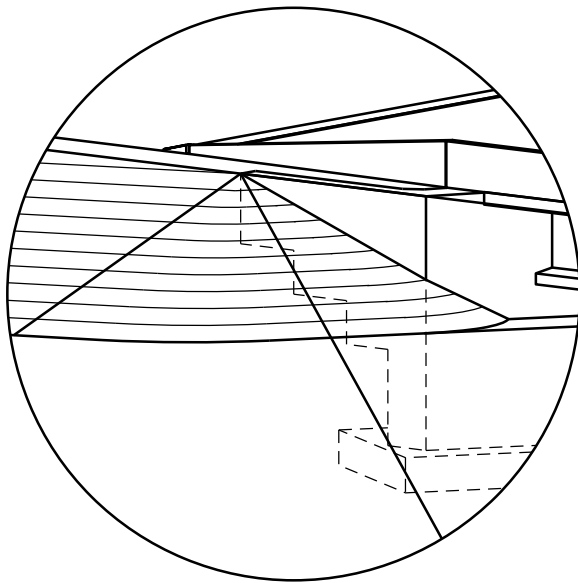


- ### REQUIRED LIST
- ① Title Block
 - ② Project Block
 - ③ Estimated Quantities
 - ④ Plan View
 - ⑤ Section A - A
 - ⑥ Detail "X"
 - ⑦ Spill Cone Detail

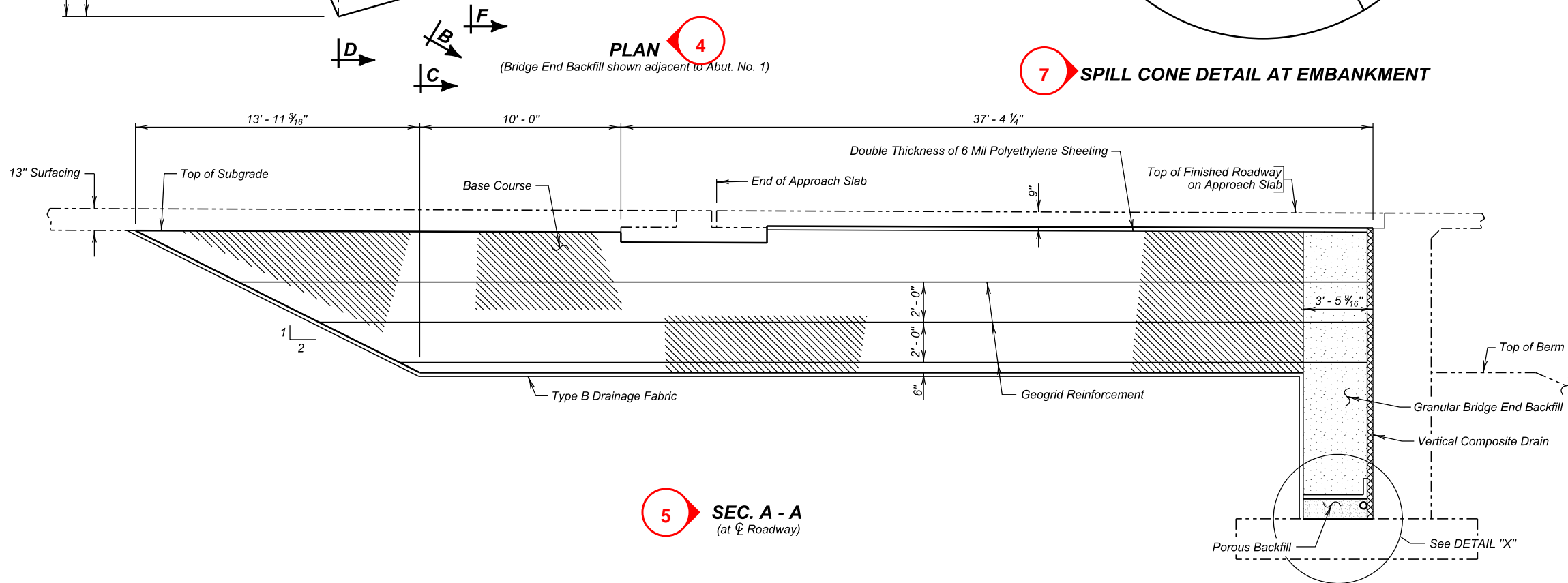
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Granular Bridge End Backfill	Cu. Yd.	81.5
Bridge End Embankment	Cu. Yd.	704.9
Base Course	Ton	1832.2
Porous Backfill	Ton	16.3
4" Underdrain Pipe	Ft.	113
Geogrid Reinforcement	Sq. Yd.	843

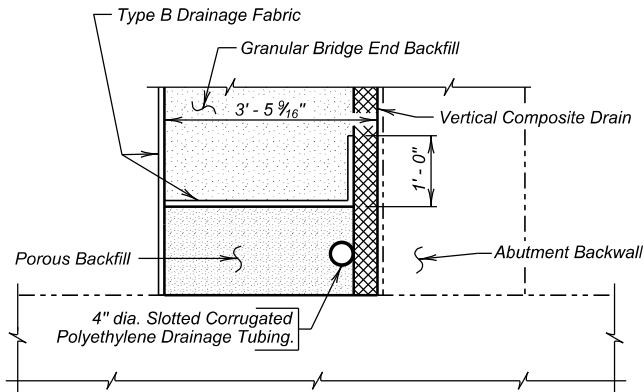
- 68 ft. 4" dia. Slotted Corrugated Polyethylene Drainage Tubing.
 - 35 ft. 4" dia. Corrugated Polyethylene Drainage Tubing.
 - 603 sq. ft. Vertical Composite Drain
 - 10 ft. 4" dia. Std. Black Pipe with Rodent Screens.
- Items 1 thru 4 are approximate quantities contained in the 4" Underdrain Pipe and are for information only.
- 2869 sq. ft. 6 mil Polyethylene Sheeting, not including laps.
 - 334 sq. yd. Type B Drainage Fabric.
- Items 5 and 6 are approximate quantities contained in the Granular Bridge End Backfill and are for information only.
- For estimating purposes only, a factor of 1.89 tons/cu. yd. was used to convert cu. yds. to tons.
- Shrinkage Factor of 1.25 Used.
- Payment quantities will be based on area covered plus 15% to account for overlaps.



7 SPILL CONE DETAIL AT EMBANKMENT



5 SEC. A - A (at Roadway)



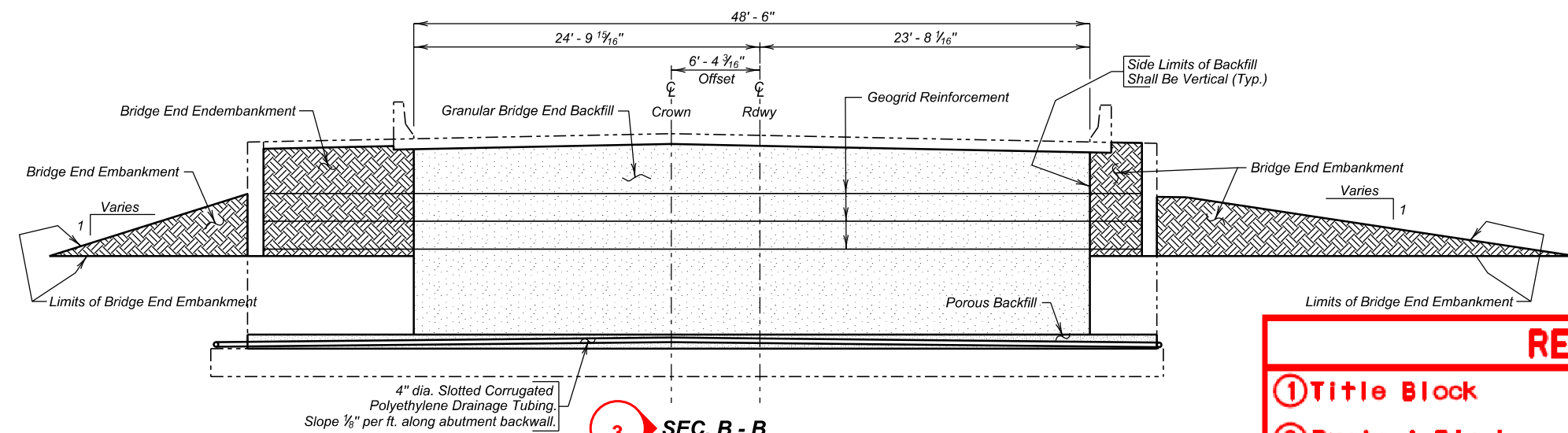
DETAIL "X"

1 DETAILS OF BRIDGE END BACKFILL ADJACENT TO ABUTMENT NO. 1 (A) FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

DESIGNED BY CH	CK. DES. BY BS	DRAFTED BY MG	BRIDGE ENGINEER Steve A. Johnson
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3 SEC. B - B

- REQUIRED LIST
- 1 Title Block

2 Project Block

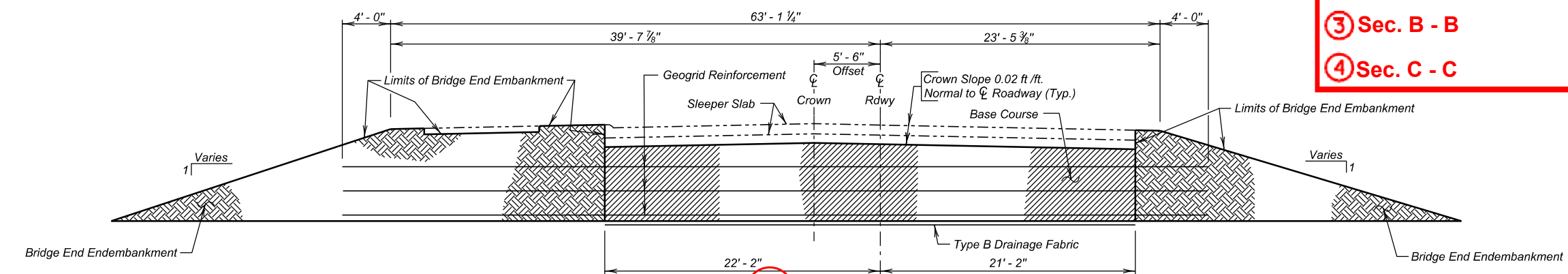
3 Sec. B - B

4 Sec. C - C

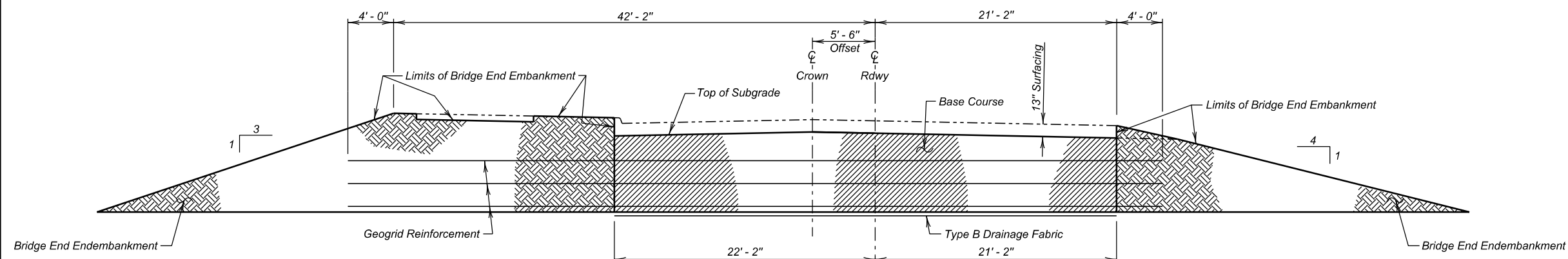
5 Sec. D - D

6 Sec. E - E

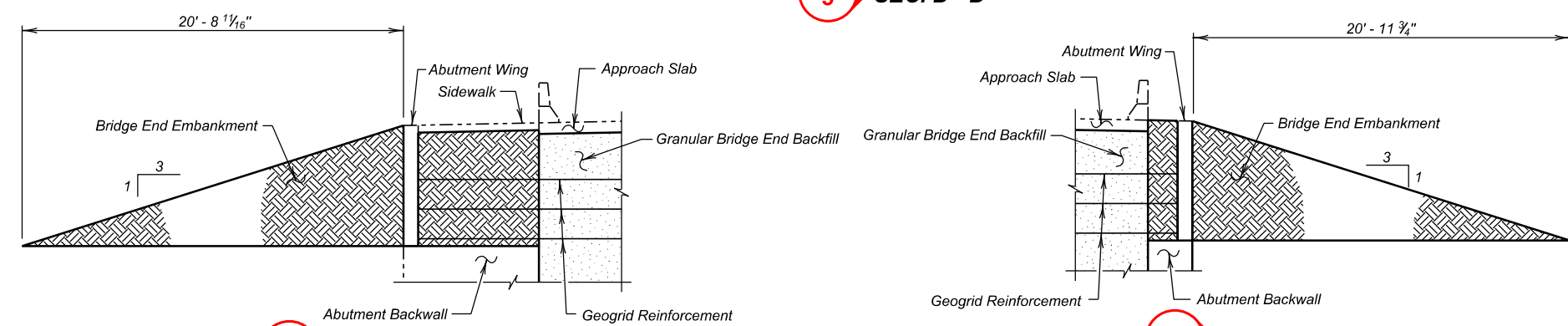
7 Sec. F - F



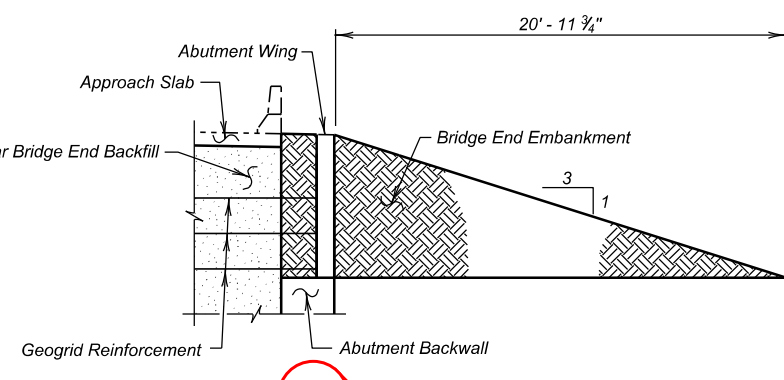
4 SEC. C - C



5 SEC. D - D



6 SEC. E - E

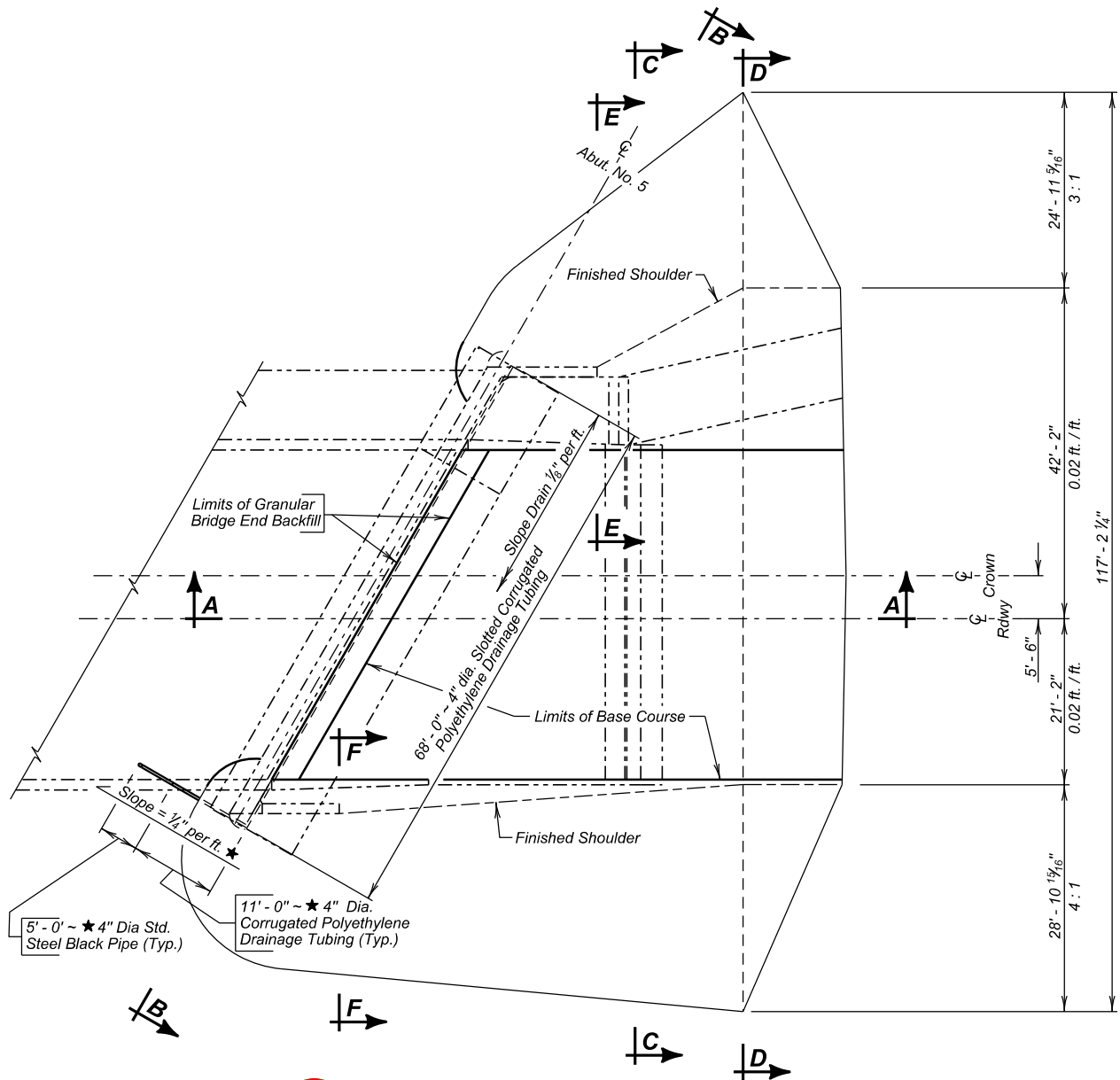


7 SEC. F - F

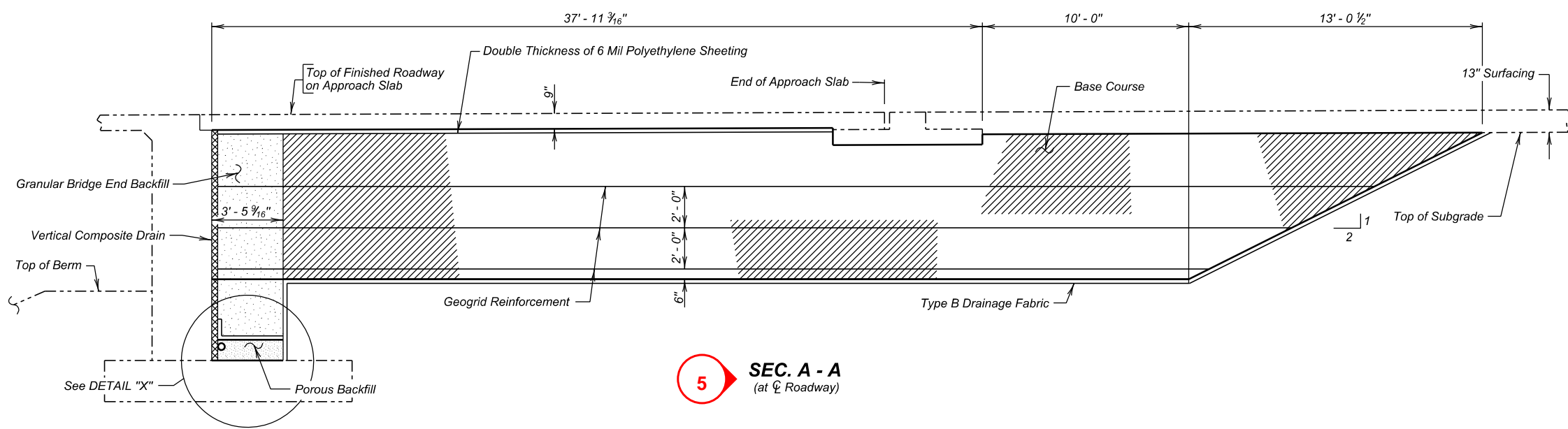
1 DETAILS OF BRIDGE END BACKFILL
ADJACENT TO ABUTMENT NO. 1 (B)
FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
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APRIL 2016



4 PLAN
(Bridge End Backfill shown adjacent to Abut. No. 5)



5 SEC. A - A
(at C Roadway)

- REQUIRED LIST
- 1 Title Block

2 Project Block

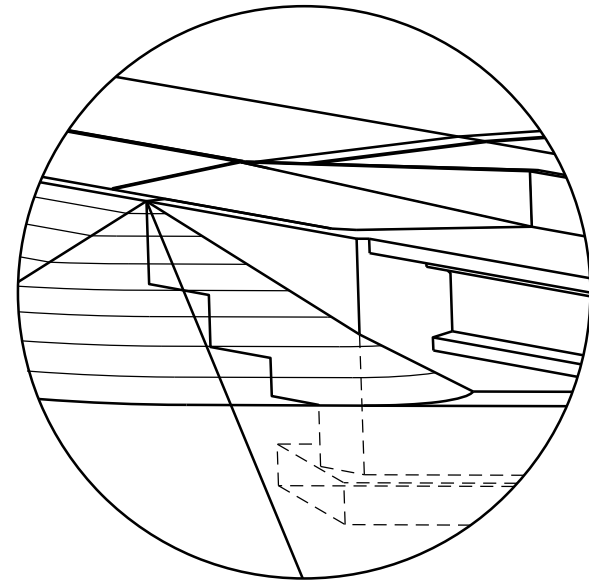
3 Estimated Quantities

4 Plan View

5 Section A - A

6 Detail "X"

7 Spill Cone Detail

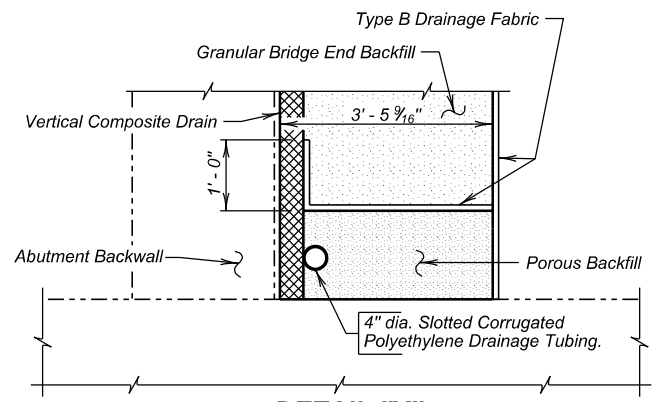


7 SPILL CONE DETAIL AT EMBANKMENT

2	STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
	S.D.			

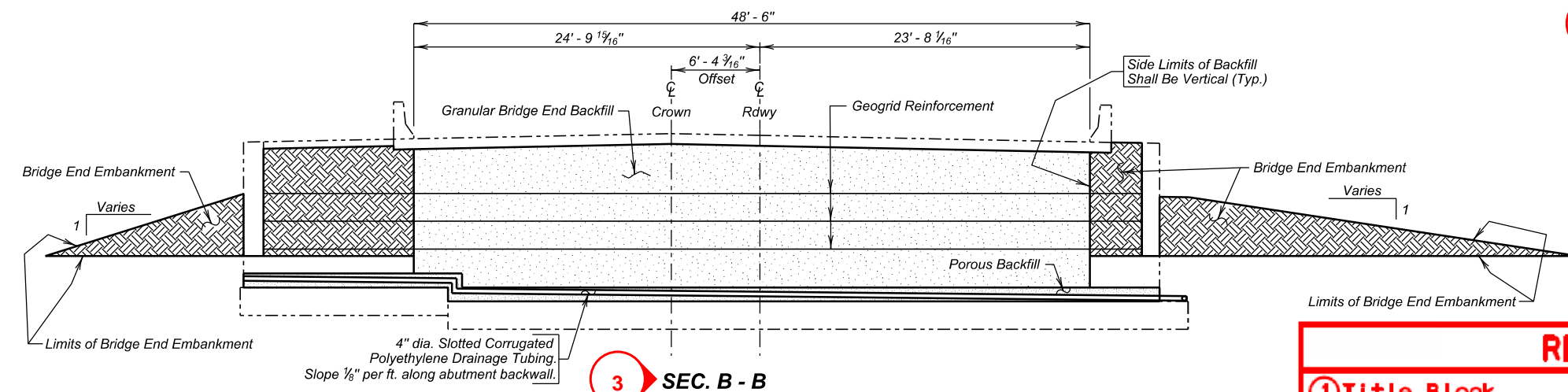
3 ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Granular Bridge End Backfill	Cu. Yd.	64.1
Bridge End Embankment	Cu. Yd.	510.0
Base Course	Ton	1446.4
Porous Backfill	Ton	16.3
4" Underdrain Pipe	Ft.	100
Geogrid Reinforcement	Sq. Yd.	797

1. 68 ft. 4" dia. Slotted Corrugated Polyethylene Drainage Tubing.
2. 22 ft. 4" dia. Corrugated Polyethylene Drainage Tubing.
3. 457 sq. ft. Vertical Composite Drain
4. 10 ft. 4" dia. Std. Black Pipe with Rodent Screens.
- Items 1 thru 4 are approximate quantities contained in the 4" Underdrain Pipe and are for information only.
5. 2919 sq. ft. 6 mil Polyethylene Sheeting, not including laps.
6. 347 sq. yd. Type B Drainage Fabric.
- Items 5 and 6 are approximate quantities contained in the Granular Bridge End Backfill and are for information only.
- For estimating purposes only, a factor of 1.89 tons/cu. yd. was used to convert cu. yds. to tons.
- Shrinkage Factor of 1.25 Used.
- Payment quantities will be based on area covered plus 15% to account for overlaps.



6 DETAIL "X"

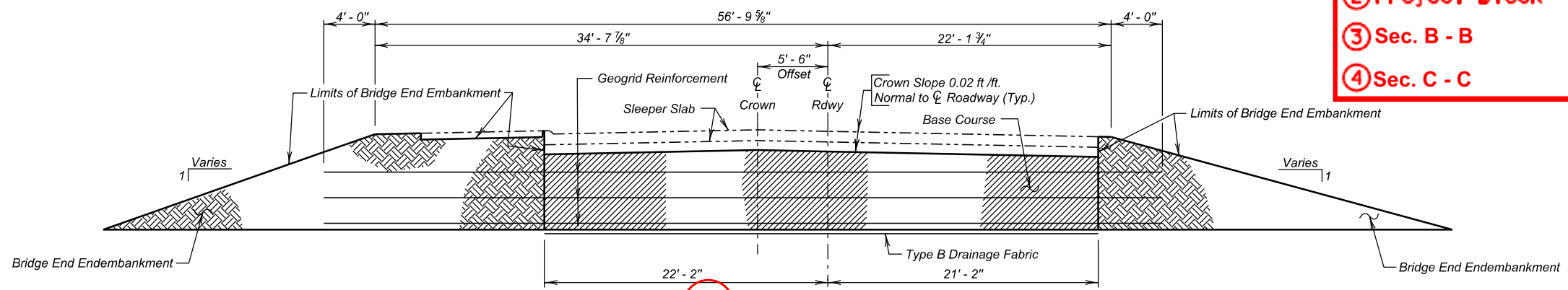
- 1 DETAILS OF BRIDGE END BACKFILL ADJACENT TO ABUTMENT NO. 5 (A) FOR
- 430' - 10 5/8" PRESTR. GIRDER BRIDGE
- 42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
- OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
- STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
- STR. NO. 50-206-020 HL-93



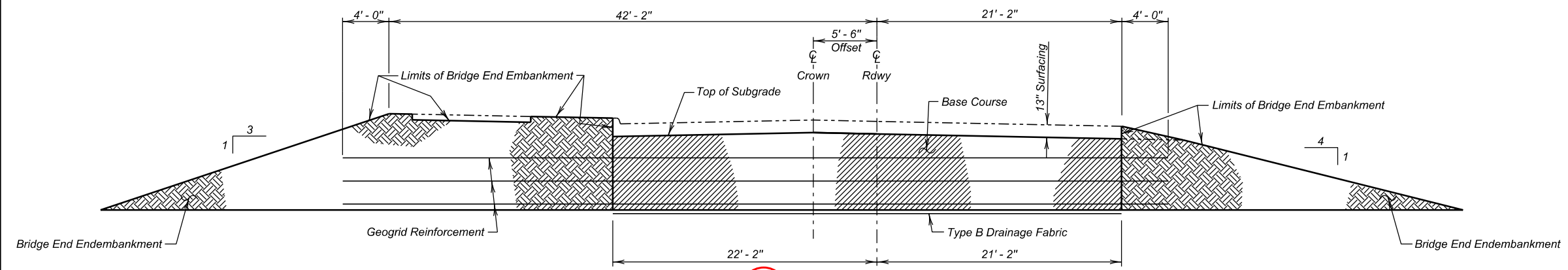
3 SEC. B - B

- 1 Title Block
2 Project Block
3 Sec. B - B
4 Sec. C - C

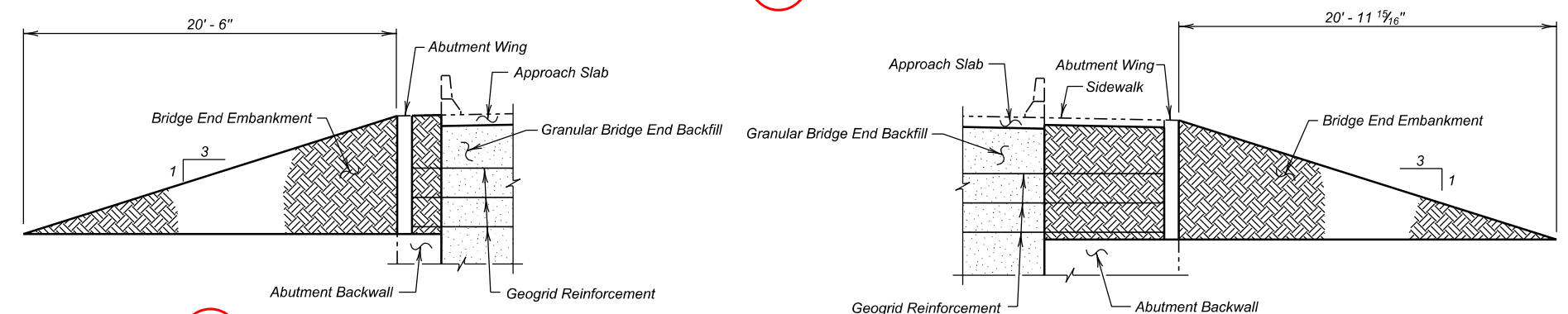
5 Sec. D - D
6 Sec. E - E
7 Sec. F - F



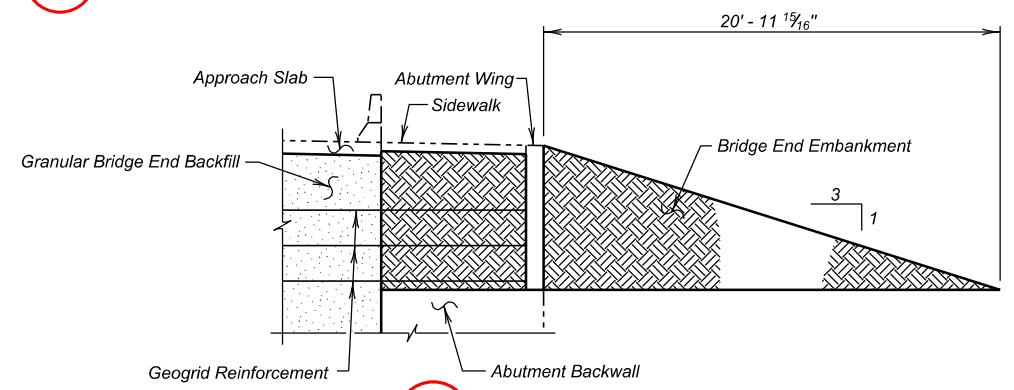
4 SEC. C - C



5 SEC. D - D



7 SEC. F - F



6 SEC. E - E

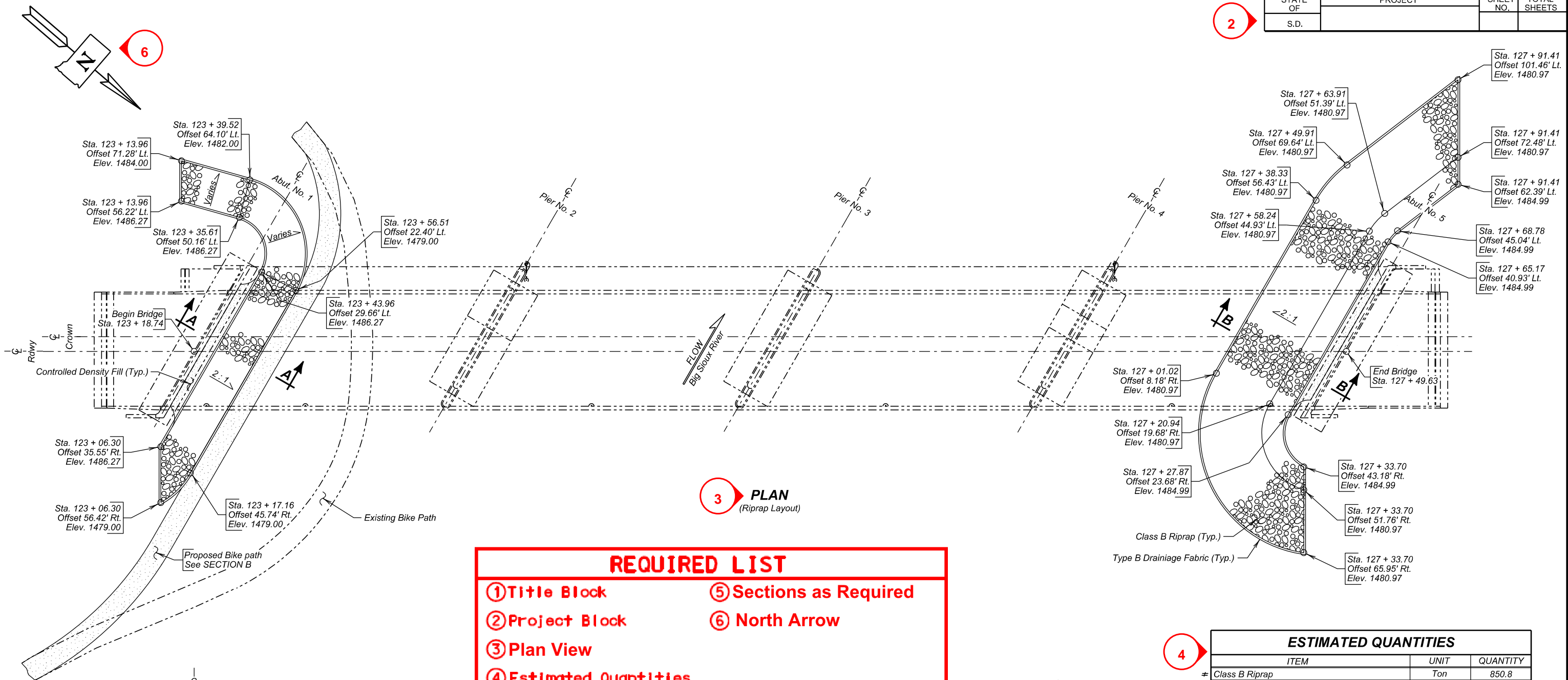
1
DETAILS OF BRIDGE END BACKFILL
ADJACENT TO ABUTMENT NO. 5 (B)
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

DESIGNED BY CH
CK. DES. BY BS
DRAFTED BY MG
Steve A. Johnson
BRIDGE ENGINEER

38 OF 50

2



3

PLAN
(Riprap Layout)

REQUIRED LIST

- ① Title Block
- ② Project Block
- ③ Plan View
- ④ Estimated Quantities
- ⑤ Sections as Required
- ⑥ North Arrow

4

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class B Riprap	Ton	850.8
Type B Drainage Fabric	Sq. Yd.	1073
Controlled Density Fill	Cu. Yd.	9.3

* For estimating purposes only, a factor of 1.4 tons/cu.yd. was used to convert Cu. Yds. to Tons.

1

RIPRAP DETAILS

FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY

S. D. DEPT. OF TRANSPORTATION

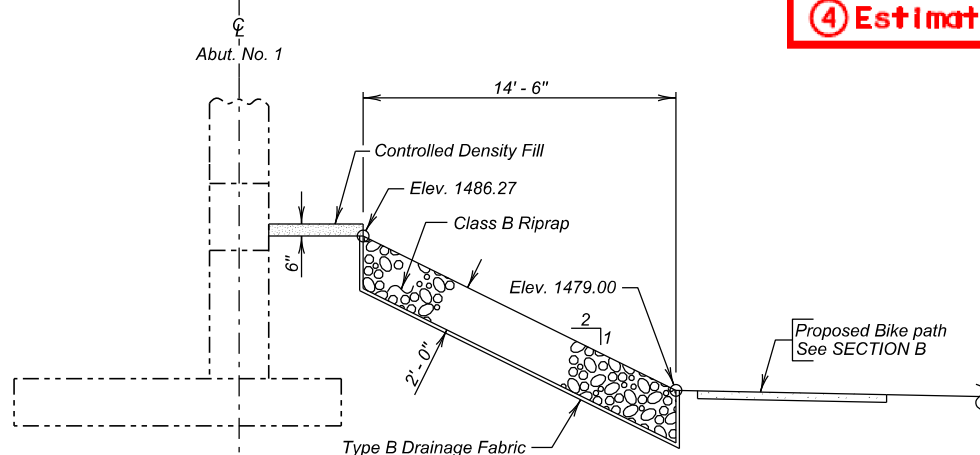
APRIL 2016

39 OF 50

DESIGNED BY BB	CK. DES. BY TD	DRAFTED BY BT	Steve A. Johnson BRIDGE ENGINEER
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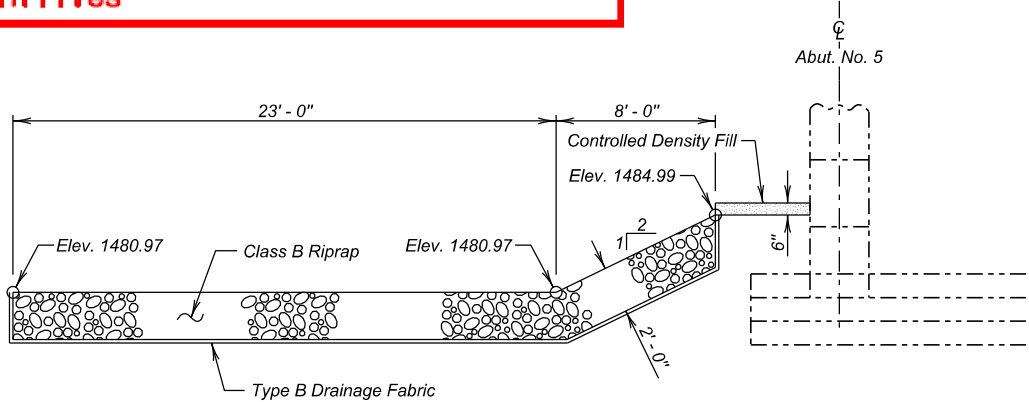
5

SEC. A - A



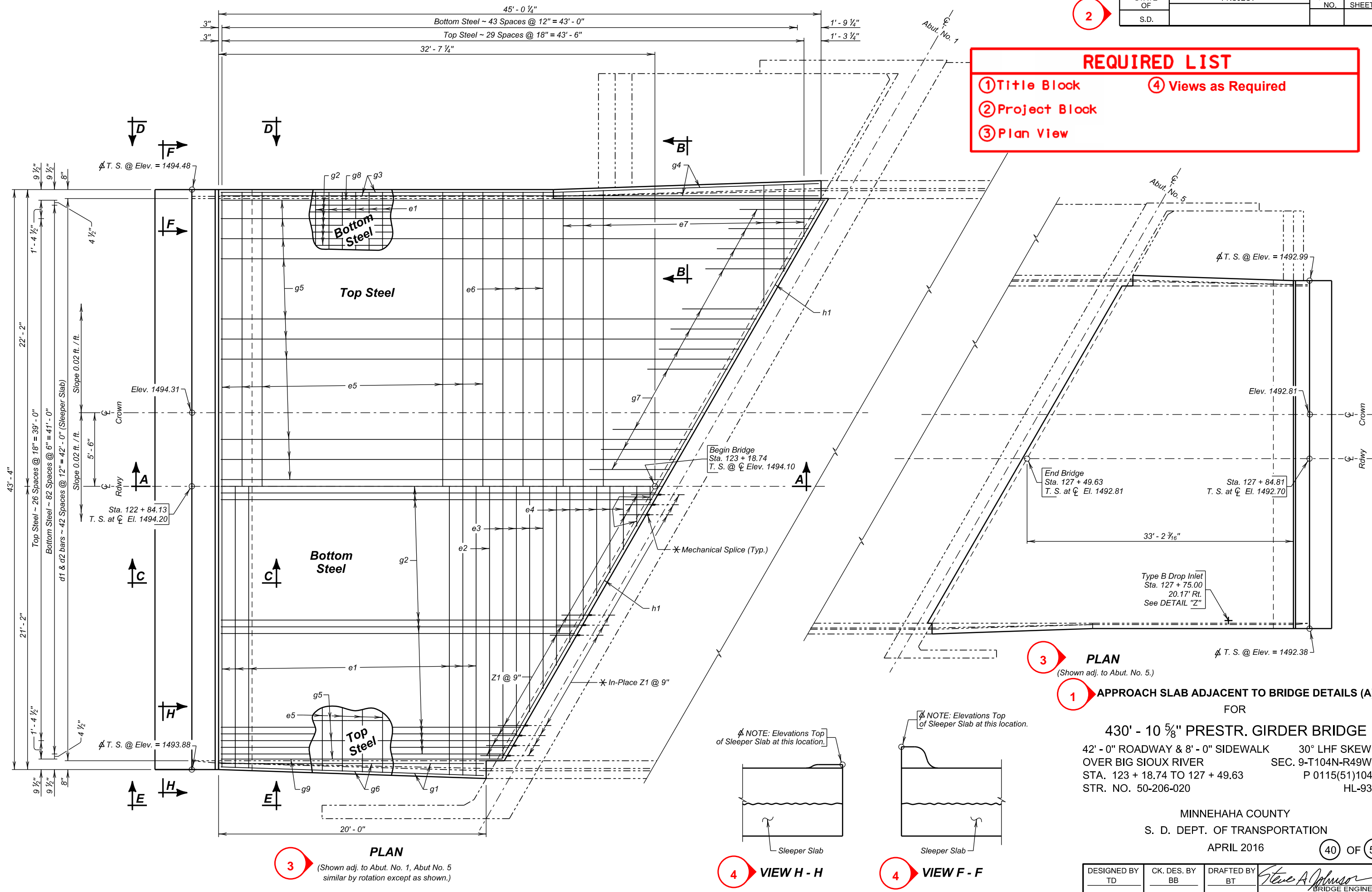
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SEC. B - B



REQUIRED LIST

- ① Title Block
- ② Project Block
- ③ Plan View
- ④ Views as Required



REINFORCING SCHEDULE					Bending Details	
(For Two Approach Slabs & Two Sleeper Slabs)						
Mk.	No.	Size	Length	Type		
Sleeper Slabs						
c1	48	5	43' - 0"	Str.	d1 6' - 11"	
d1	172	4	7' - 9"	2	Type 2	
d2	86	4	6' - 1"	T2		
Approach Slabs						
a3	2	4	7' - 4"	19A	Type T2	
e1	20	6	86' - 7"	Str.	1' - 3"	
e2	2	6	42' - 4"	Str.	d2 1' - 5"	
e3	4	6	79' - 4"	Str.	Type T2	
e4	19	6	40' - 3"	Str.	1 1' 1' 2' 0"	
e5	14	4	86' - 7"	Str.	a3 3' - 4"	
e6	3	4	79' - 4"	Str.	Type 19A	
e7	13	4	38' - 5"	Str.		
g1	4	8	19' - 8"	Str.		
g2	83	8	66' - 3"	Str.		
g3	4	8	44' - 8"	Str.		
g4	4	4	44' - 8"	Str.		
g5	29	4	66' - 2"	Str.		
g6	4	4	19' - 8"	Str.		
g7	56	4	6' - 0"	Str.		
g8	2	8	45' - 2"	Str.		
g9	2	8	21' - 0"	Str.		
h1	4	6	48' - 1"	Str.		
Z1	112	7	2' - 0"	Str.		
					45' - 1 1/2"	21' - 0 1/2" g5
					44' - 11 1/2"	21' - 3 1/2" g2
					34' - 6"	3' - 11" e7
					35' - 5"	4' - 10" e4
					42' - 3"	37' - 1" e3 or e6
					43' - 7"	43' - 0" e1 or e5
					43' - 0"	43' - 7" e1 or e5
					37' - 1"	42' - 3" e3 or e6
					4' - 10"	35' - 5" e4
					3' - 11"	34' - 6" e7
					21' - 3 1/2"	44' - 11 1/2" g2
					21' - 0 1/2"	45' - 1 1/2" g5
					Cut 129 g5	
					Cut 83 g2	
					Cut 13 e7	
					Cut 3 e6	
					Cut 14 e5	
					Cut 19 e4	
					Cut 4 e3	
					Cut 20 e1	

NOTE:
All bars to be epoxy coated.
All dimensions are out to out of bars.
△ See cutting diagram.

ESTIMATED QUANTITIES		
(For Two Approach Slabs & Two Sleeper Slabs)		
ITEM	UNIT	QUANTITY
Concrete Approach Slab for Bridge	Sq. Yd.	325.0
Concrete Approach Sleeper Slab for Bridge	Sq. Yd.	69.9

- 81.9 Cu. Yds. Concrete in Approach Slabs.
- 23355 Lbs. Epoxy Coated Re-Steel in Approach Slabs.
- 21.6 Sq. Ft. of Polystyrene Insulation Board.
- 22.0 Cu. Yds. Concrete in Sleeper Slabs.
- 3393 Lbs. Epoxy Coated Re-Steel in Sleeper Slabs.
- 3.8 Cu. Yds. Concrete in Tapered Barriers.
- 1071 Lbs. Epoxy Coated Re-Steel in Tapered Barriers.

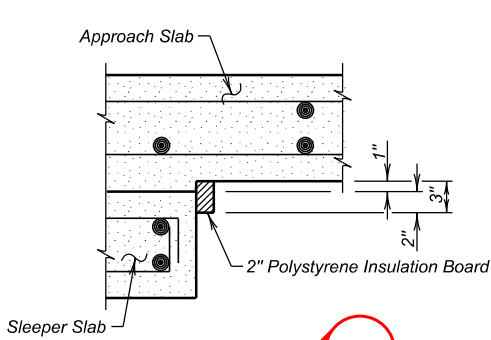
Items 1 thru 7 are approximate quantities contained in the above bid items and are for information only.

1 APPROACH SLAB ADJACENT TO BRIDGE DETAILS (B) FOR

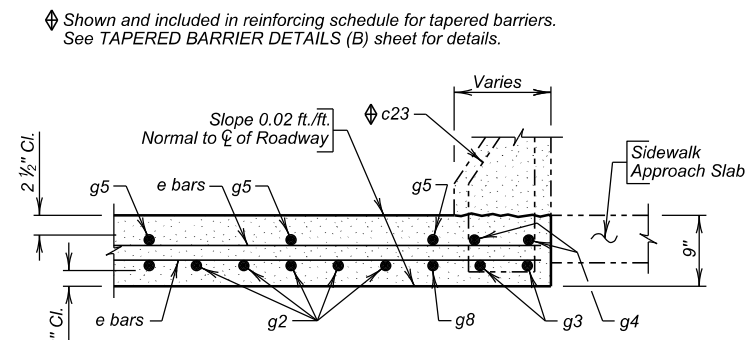
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

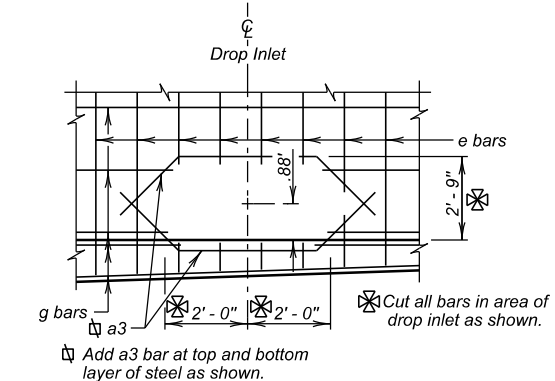
DESIGNED BY TD	CK. DES. BY BB	DRAFTED BY BT	Steve A. Johnson BRIDGE ENGINEER
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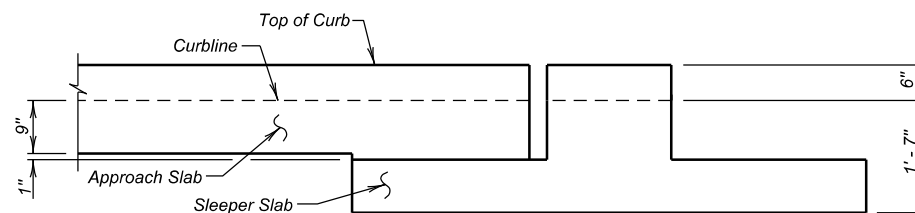
6 DETAIL "Q"



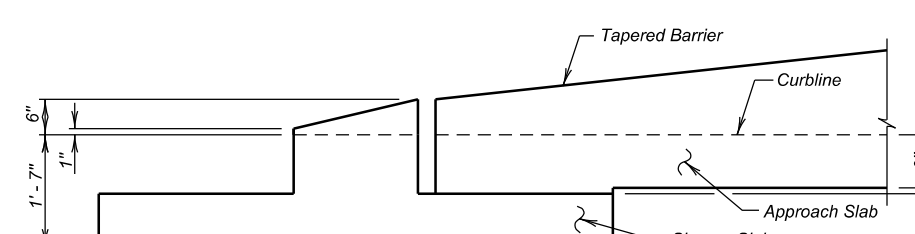
7 SEC. B - B



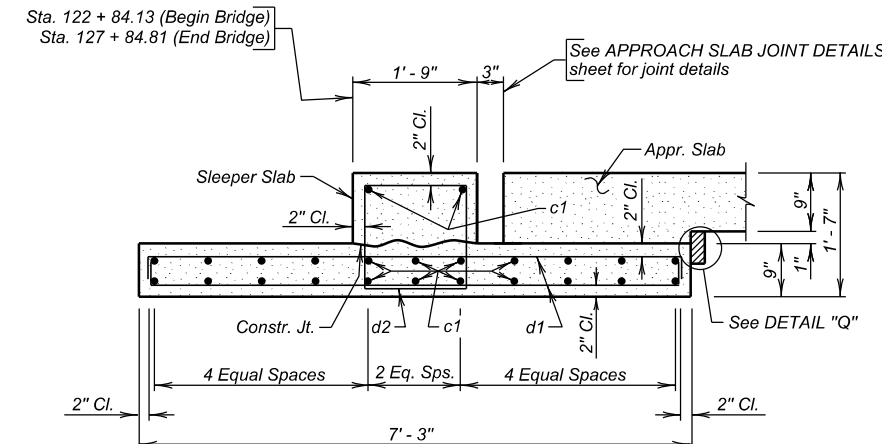
6 DETAIL "Z"
(Typical plan for steel when drop inlet is used.)



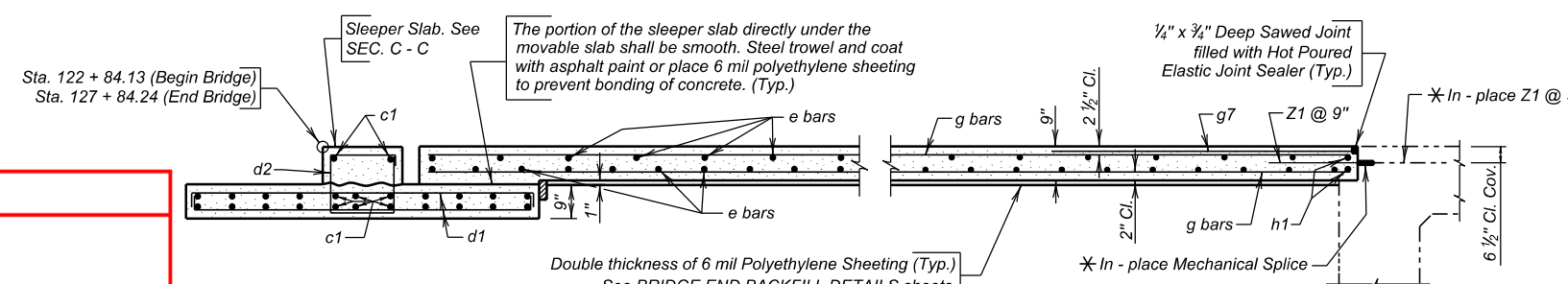
5 VIEW D - D



5 VIEW E - E



7 SEC. C - C
(Sleeper Slab)



7 SEC. A - A

- Required List
- 1 Title Block

2 Project Block

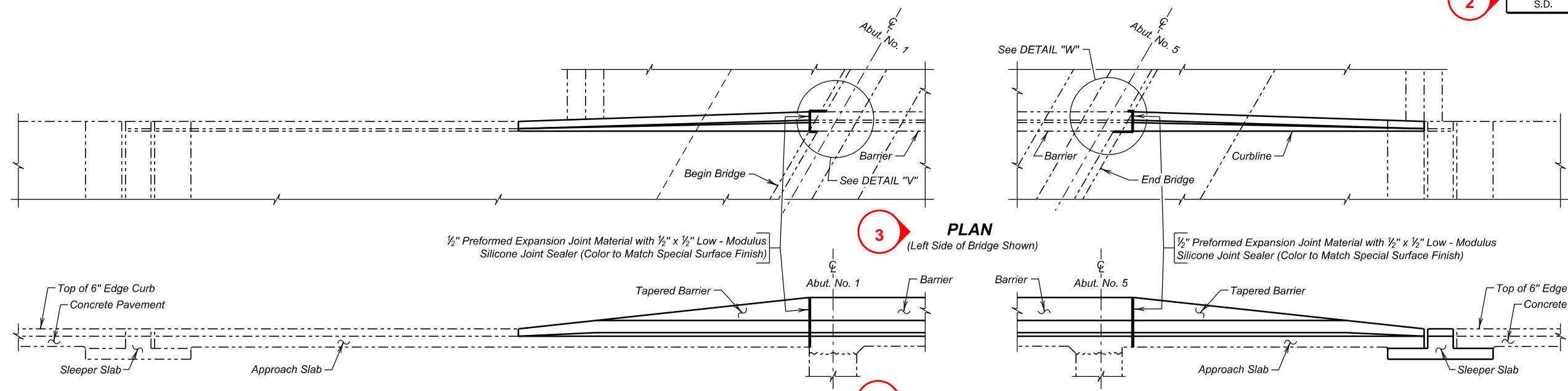
3 Reinforcing Schedule

4 Estimated Quantities

5 Views as Required

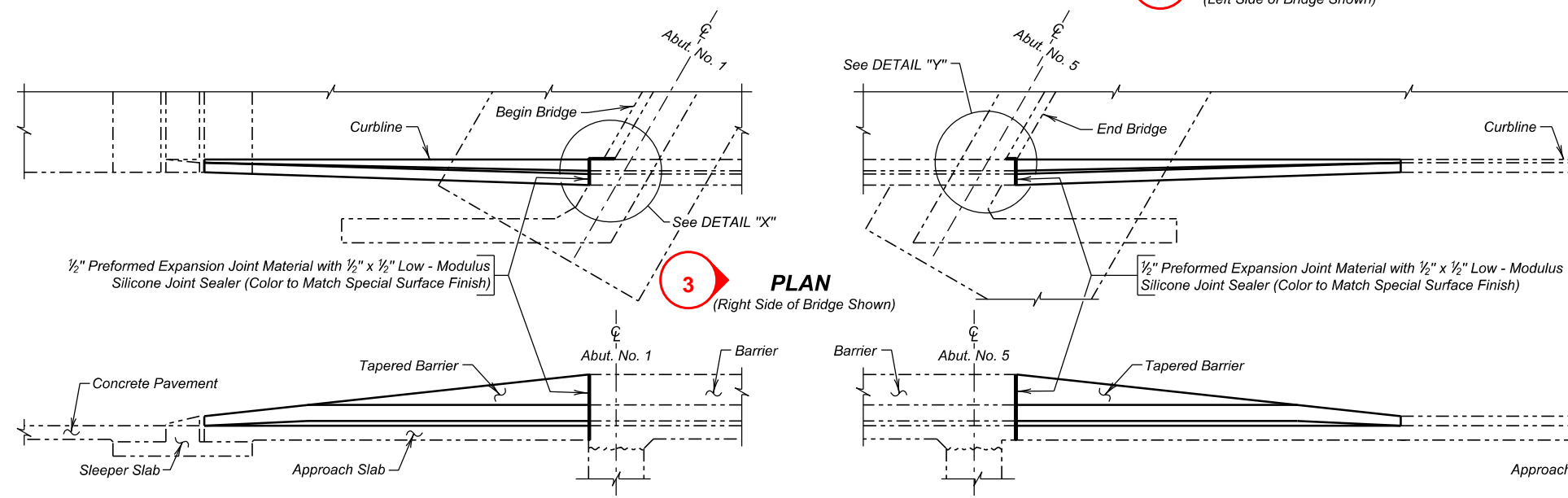
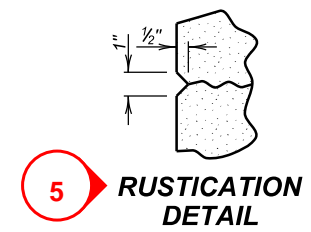
6 Details as Required

7 Sections as Required



3 PLAN
(Left Side of Bridge Shown)

4 ELEVATION
(Left Side of Bridge Shown)



3 PLAN
(Right Side of Bridge Shown)

4 ELEVATION
(Right Side of Bridge Shown)

- REQUIRED LIST
- 1 Title Block

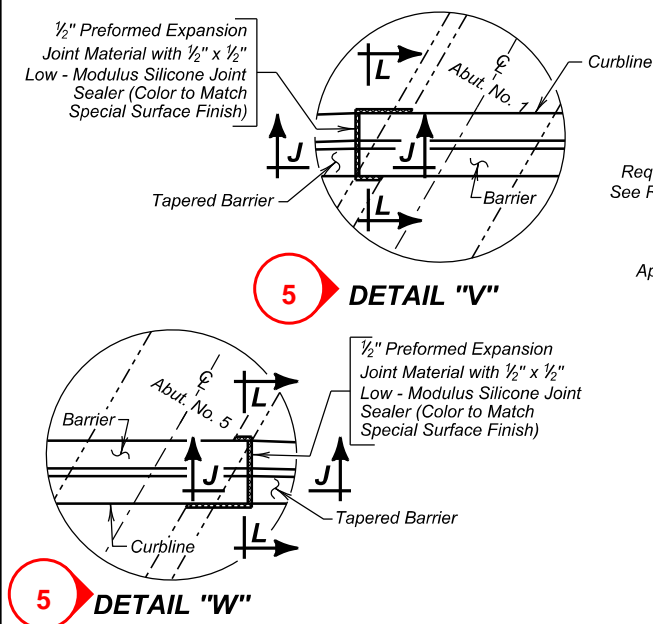
2 Project Block

3 Plan View

4 Elevation View

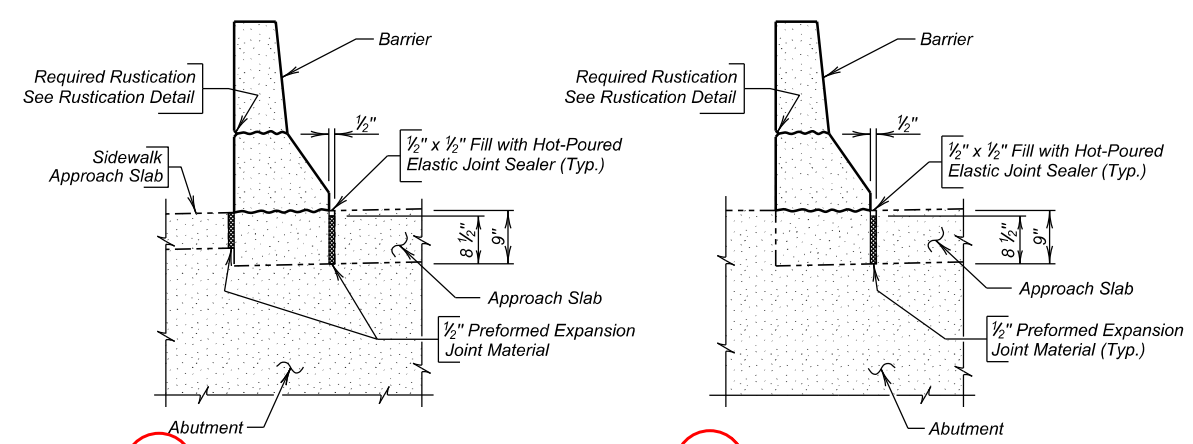
5 Details as Required

6 Sections as Required



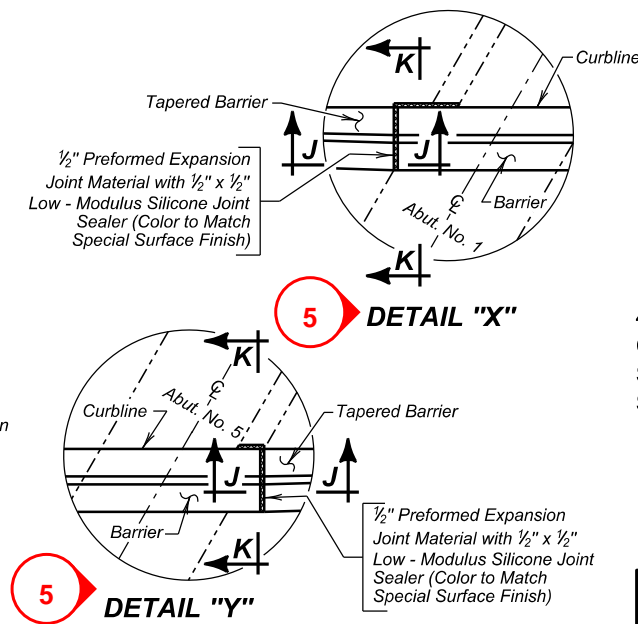
5 DETAIL "V"

5 DETAIL "W"



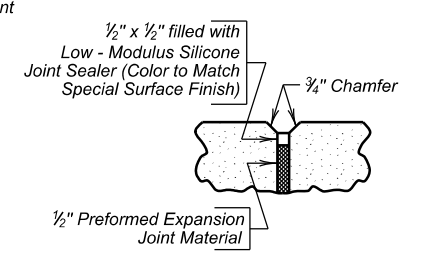
6 SEC. L - L

6 SEC. K - K



5 DETAIL "X"

5 DETAIL "Y"



SEC. J - J

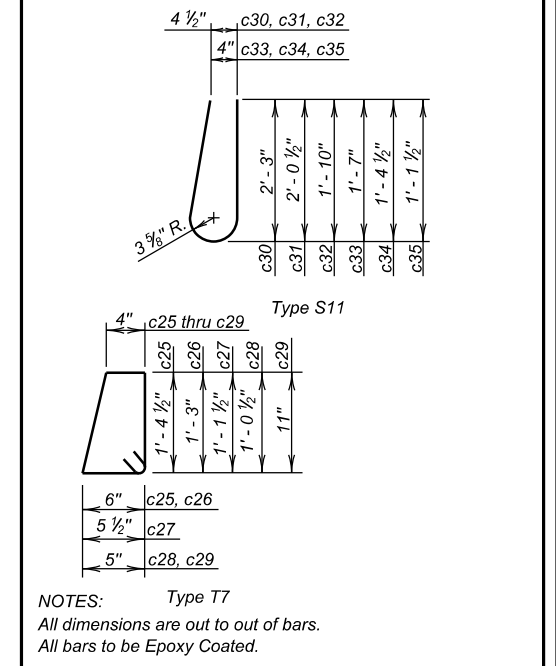
1 TAPERED BARRIER DETAILS (A)
FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

REINFORCING SCHEDULE					
Mk.	No.	Size	Length	Type	Bending Details
4 Tapered Barrier Curbs					
c20	12	5	5' - 8"	T1A	4" 3 1/2" c24
c21	12	5	5' - 5"	T1A	5" 4" c23
c22	12	5	5' - 3"	T1A	5" 5" c22
c23	12	5	5' - 1"	T1A	5 1/2" 5 1/2" c21
c24	12	5	4' - 11"	T1A	6 1/2" 6" c20
c25	4	5	4' - 6"	T7	
c26	4	5	4' - 3"	T7	
c27	4	5	4' - 0"	T7	
c28	4	5	3' - 9"	T7	
c29	4	5	3' - 6"	T7	
c30	8	5	4' - 10"	S11	
c31	8	5	4' - 5"	S11	
c32	8	5	4' - 0"	S11	
c33	8	5	3' - 6"	S11	
c34	8	5	3' - 1"	S11	
c35	12	5	2' - 7"	S11	
d10	8	5	19' - 9"	Str.	
d11	8	5	4' - 9"	Str.	
d12	8	5	10' - 0"	Str.	
d13	8	5	14' - 4"	Str.	
d14	4	4	19' - 8"	Str.	

Type T1A



- REQUIRED LIST
- 1 Title Block

2 Project Block

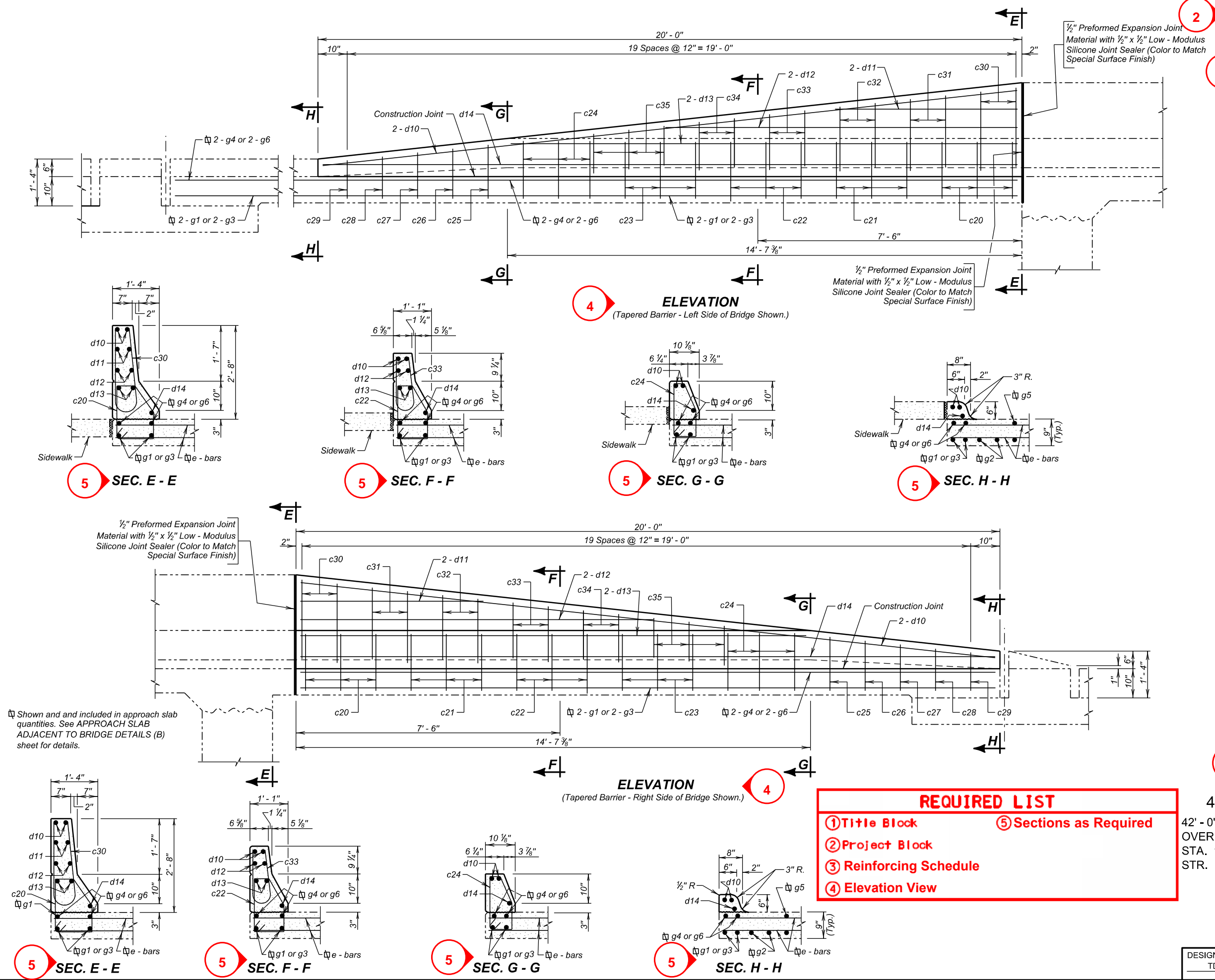
3 Reinforcing Schedule

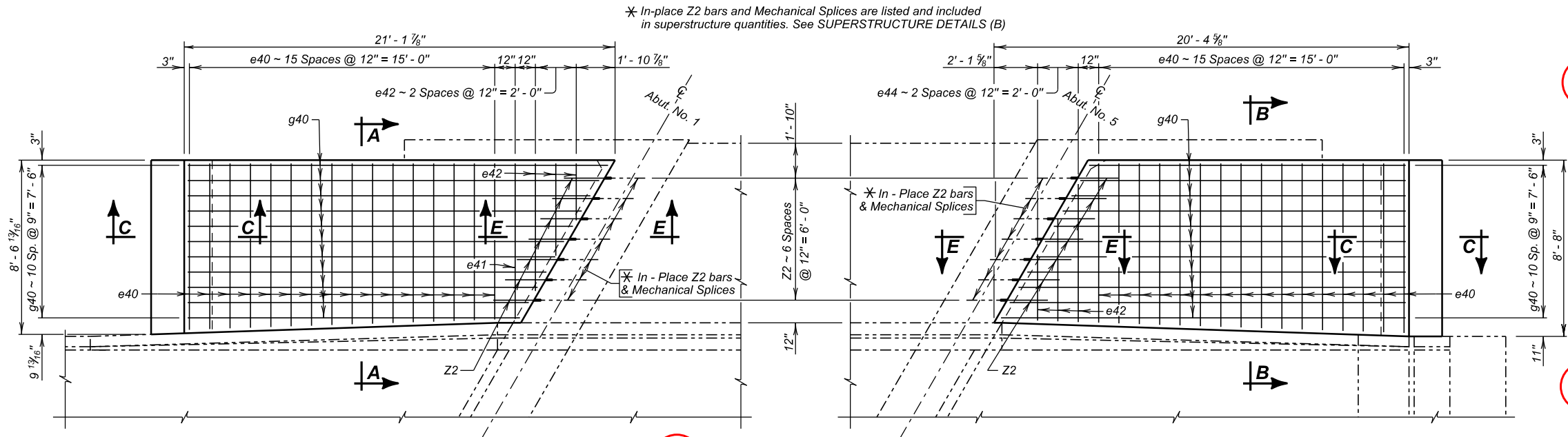
4 Elevation View

5 Sections as Required

1 TAPERED BARRIER DETAILS (B) FOR 430' - 10 5/8" PRESTR. GIRDER BRIDGE 42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW OVER BIG SIOUX RIVER SEC. 9-T104N-R49W STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104 STR. NO. 50-206-020 HL-93 MINNEHAHA COUNTY S. D. DEPT. OF TRANSPORTATION APRIL 2016 43 OF 50

DESIGNED BY TD CK. DES. BY BB DRAFTED BY BT Steve A. Johnson BRIDGE ENGINEER





PLAN
(Sidewalk Approach Slabs)

REQUIRED LIST

- 1 Title Block
- 2 Project Block
- 3 Reinforcing Schedule
- 4 Estimated Quantities
- 5 Plan View as Required
- 6 Sections as Required

REINFORCING SCHEDULE				
(For Two Sidewalk Approach Slabs and Two Sidewalk Sleeper Slabs)				
Mk.	No.	Size	Length	Type
c40	4	4	8' - 6"	Str.
c41	4	4	9' - 8"	Str.
d40	18	4	2' - 8"	Str.
e40	16	4	15' - 10"	Str.
e41	1	4	7' - 7"	Str.
e42	3	4	9' - 6"	Str.
g40	11	4	36' - 1"	Str.
Z2	14	4	2' - 0"	Str.

g40	19' - 10"	16' - 3"
e42	6' - 9"	2' - 9"
e40	8' - 2"	7' - 8"
e40	7' - 8"	8' - 2"
e42	2' - 9"	6' - 9"
g40	16' - 3"	19' - 10"

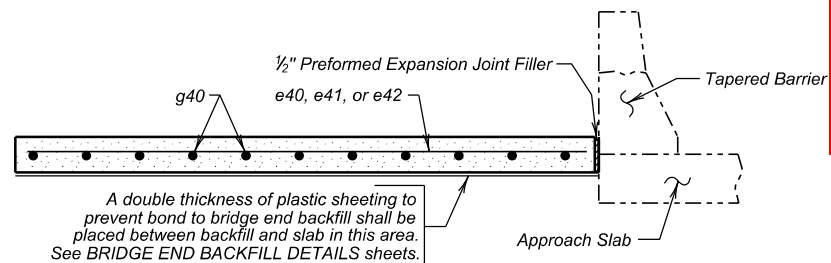
16 e40	3 e42	11 g40
Cut	Cut	Cut

NOTE:
All bars to be Epoxy Coated.
All dimensions are out to out of bars.
See cutting diagram.

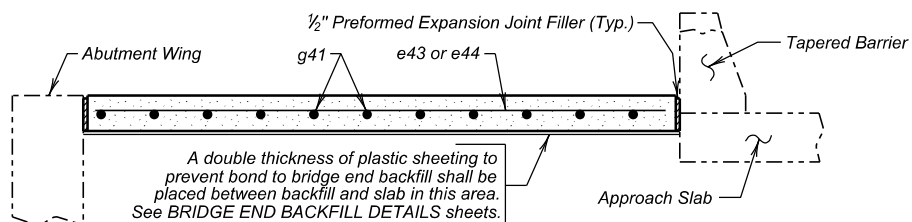
ESTIMATED QUANTITIES		
(For Two Sidewalk Approach Slabs)		
ITEM	UNIT	QUANTITY
6" Reinforced Concrete Sidewalk	Sq. Ft.	302

1. 5.7 Cu. Yds. Concrete in Sidewalk Approach Slabs.
2. 459 Lbs. Epoxy Coated Re-Steel in Sidewalk Approach Slabs.
3. 1.0 Cu. Yds. Concrete in Sidewalk Sleeper Slabs.
4. 81 Lbs. Epoxy Coated Re-Steel in Sidewalk Sleeper Slabs.
5. 561 Sq. Ft. 6 mil Polyethylene sheeting under reinf. conc. sidewalk.

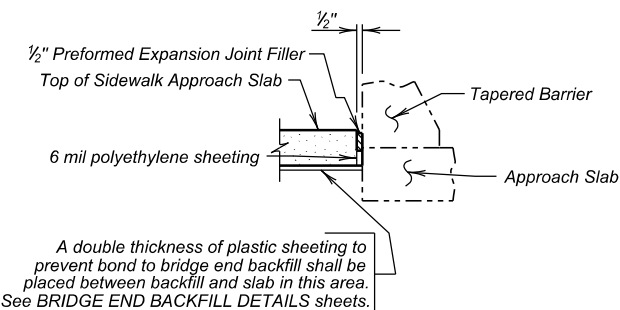
Items 1 thru 5 are approximate quantities contained in the above bid item and are for information only.



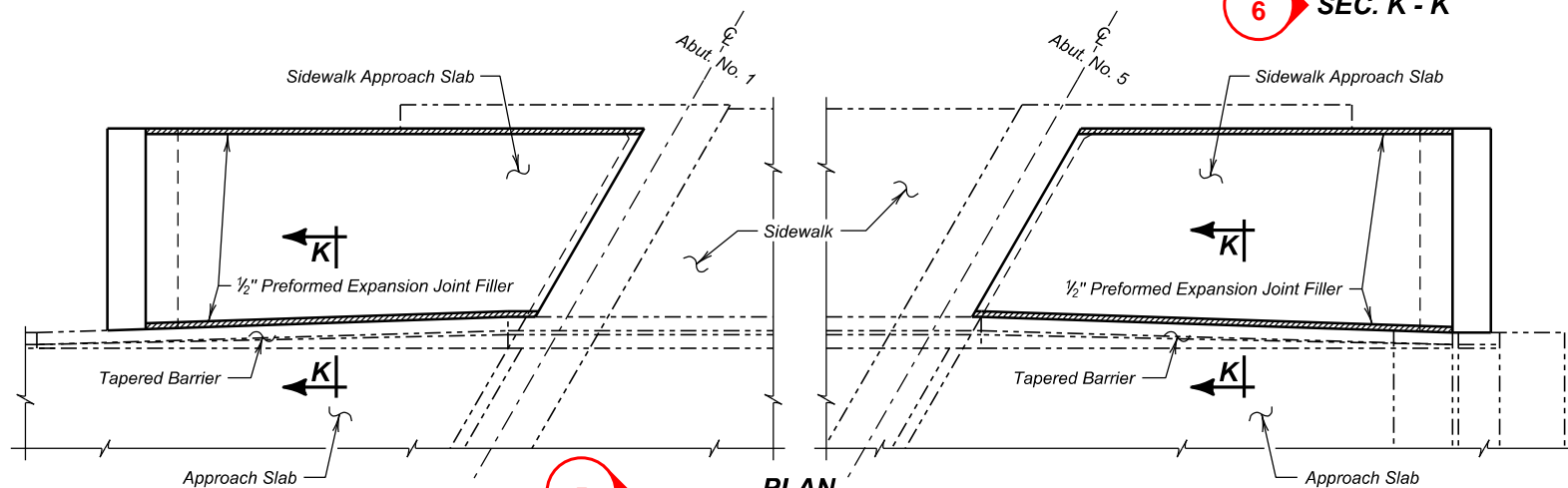
6 SEC. A - A



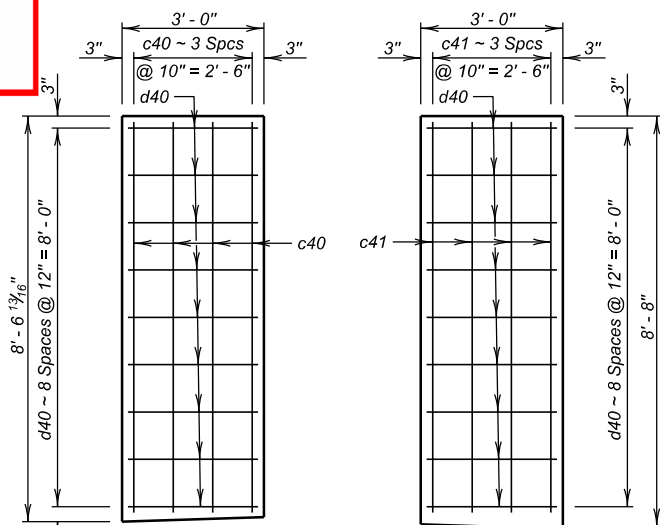
6 SEC. B - B



6 SEC. K - K

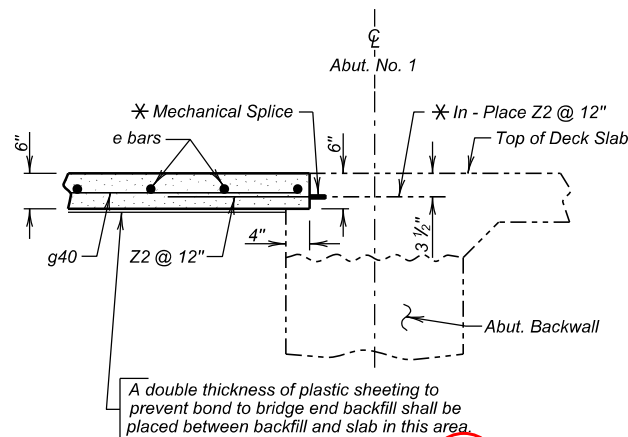


5 PLAN
(Showing Preformed Expansion Joint Filler)

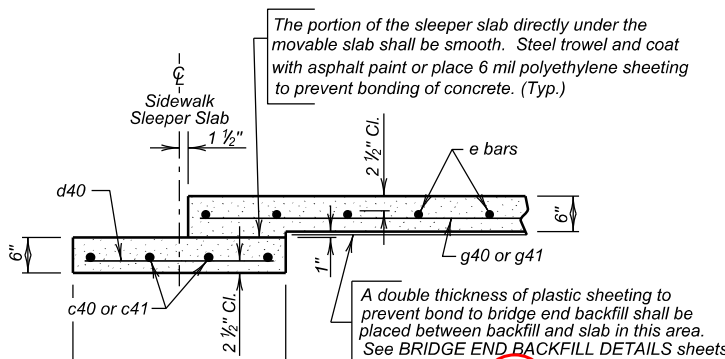


5 PLAN
(Sidewalk Sleeper Slab shown adjacent to Abut. No. 1)

5 PLAN
(Sidewalk Sleeper Slab shown adjacent to Abut. No. 5)



6 SEC. E - E



6 SEC. C - C

1 SIDEWALK APPROACH SLAB DETAILS FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

- 4
- GENERAL NOTES

1.

The Membrane Sealant shall be on the approved product list for Membrane Sealant Expansion Joints.

2.

The manufacturer shall supply the membrane sealant in packaging that precompresses the membrane sealant. The precompressed dimension shall be as recommended by the sealant manufacturer, however, in no case shall the precompressed dimension exceed 75% of the joint opening width. The foam sealant shall be slowly self expanding to permit workers ample time to install the membrane sealant before the membrane sealant exceeds the joint opening width.

3.

The membrane sealant shall provide a water tight seal throughout a joint movement range of + 25% (minimum) from the specified joint opening dimension.

4.

The membrane sealant shall be supplied in pieces a minimum of 5 feet in length. The foam sealant shall be ultra-violet and ozone resistant.

5.

The bonding adhesive used to attach the membrane sealant to the adjacent concrete shall be approved by the membrane sealant manufacturer.

6.

Adhesive used to join adjacent pieces of the membrane sealant shall be as recommended by the manufacturer.

7.

If styrofoam filler material is used in the construction, it shall be closed cell and water-tight as approved by the Engineer.

8.

The minimum ambient air temperature at the time of joint installation and adhesive curing shall be 40° F.

9.

A technical representative of the membrane sealant manufacturer shall be present at the jobsite during installation. The technical representative shall be knowledgeable in the correct procedures for the preparation and installation of the joint material to ensure the Contractor installs the joint to the manufacturers' recommendations.

10.

Surfaces that will be in contact with the membrane sealant shall be thoroughly cleaned by abrasive blasting to remove all laitance and contaminants (such as oil, curing compounds, etc.) from the surface. At a minimum, two passes of abrasive blasting with the nozzle held at an angle to within 1 to 2 inches of the surface will be required. Cleaning of the surfaces with solvents, wire brushing, or grinding shall not be permitted.

11.

After abrasive blasting, but immediately prior to membrane joint installation, the entire joint contact surface shall be air blasted. The air compressor used for joint cleaning shall be equipped with trap devices capable of providing moisture-free and oil-free air at a recommended pressure of 90 psi. To obtain complete bonding with the adhesive, the adjacent surfaces must be dry and clean. The contact surfaces for the joint shall be visually inspected by the Engineer immediately prior to joint installation to verify the surface is dry and clean.

12.

Individual spliced sections shall be installed as per the manufacturers' recommendations. The membrane joint sealant manufacturer shall submit a detailed installation procedure to the Engineer at least 5 days prior to joint installation for his review.

13.

Traffic shall not be allowed on the joint until the bonding adhesive has had time to cure, as recommended by the manufacturer.

14.

Use plywood or other material to protect concrete adjacent to the joint from spalling before any equipment is moved across the joint. Any spall areas will be repaired at the Contractor's expense by breaking out and replacing adjacent concrete, as approved by the Engineer.

15.

The Membrane Sealant Expansion Joint will be measured in feet to the nearest one-tenth foot, complete in place. Measurement will be made of the overall horizontal length. The Membrane Sealant Expansion Joint will be paid for at the contract unit price per foot complete in place. Payment for this item shall be full compensation for furnishing all the required materials in place, including labor, equipment and incidentals necessary to complete the work in accordance with the plans and the foregoing specifications.

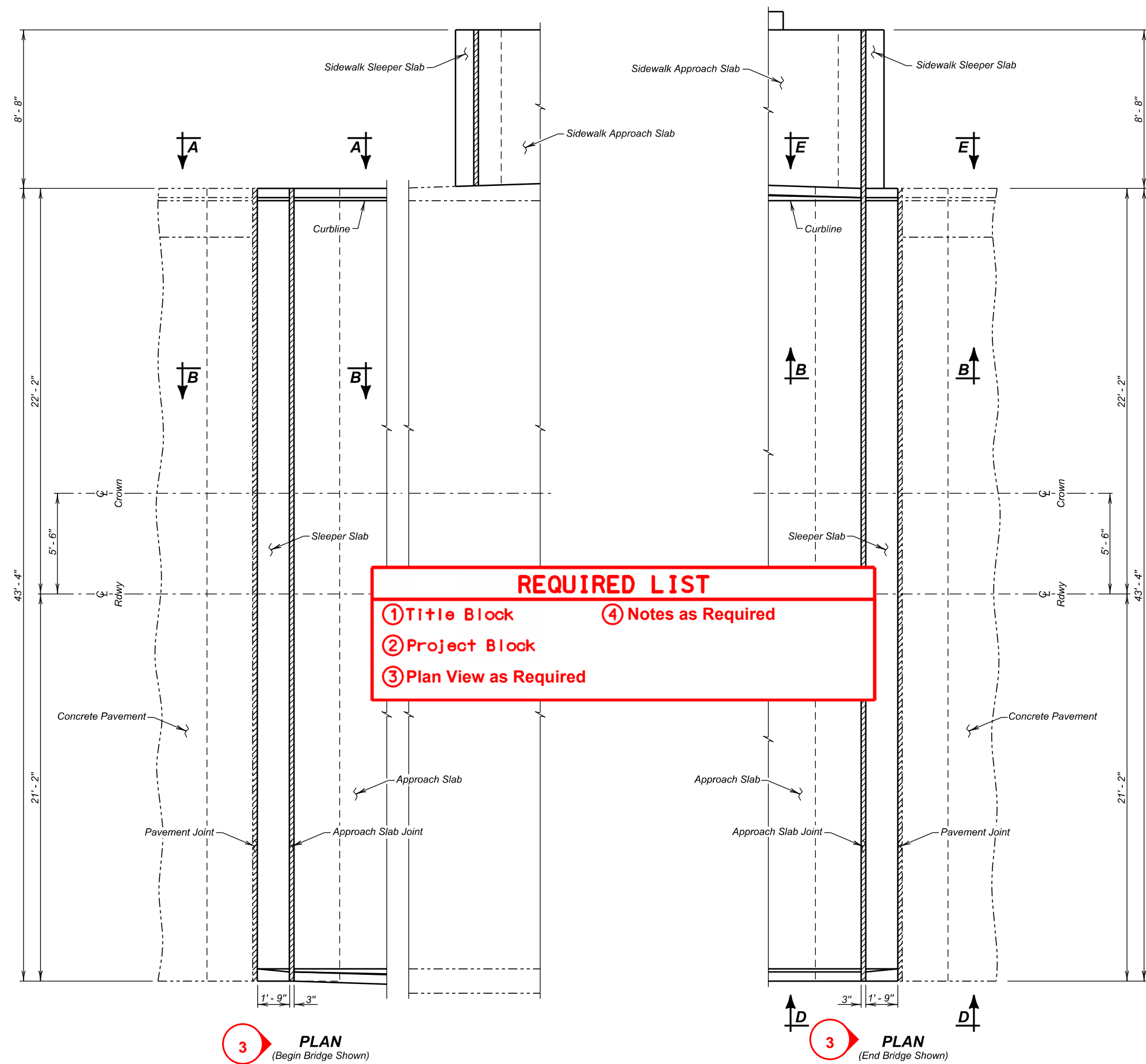
1

APPROACH SLAB JOINT DETAILS (A)
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY
S. D. DEPT. OF TRANSPORTATION
APRIL 2016

45 OF 50

DESIGNED BY TD	CK. DES. BY BB	DRAFTED BY BT	Steve A. Johnson BRIDGE ENGINEER
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REQUIRED LIST

1

Title Block

2

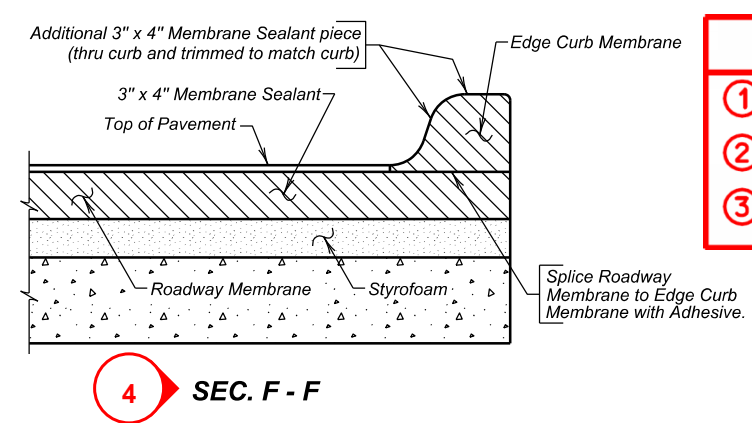
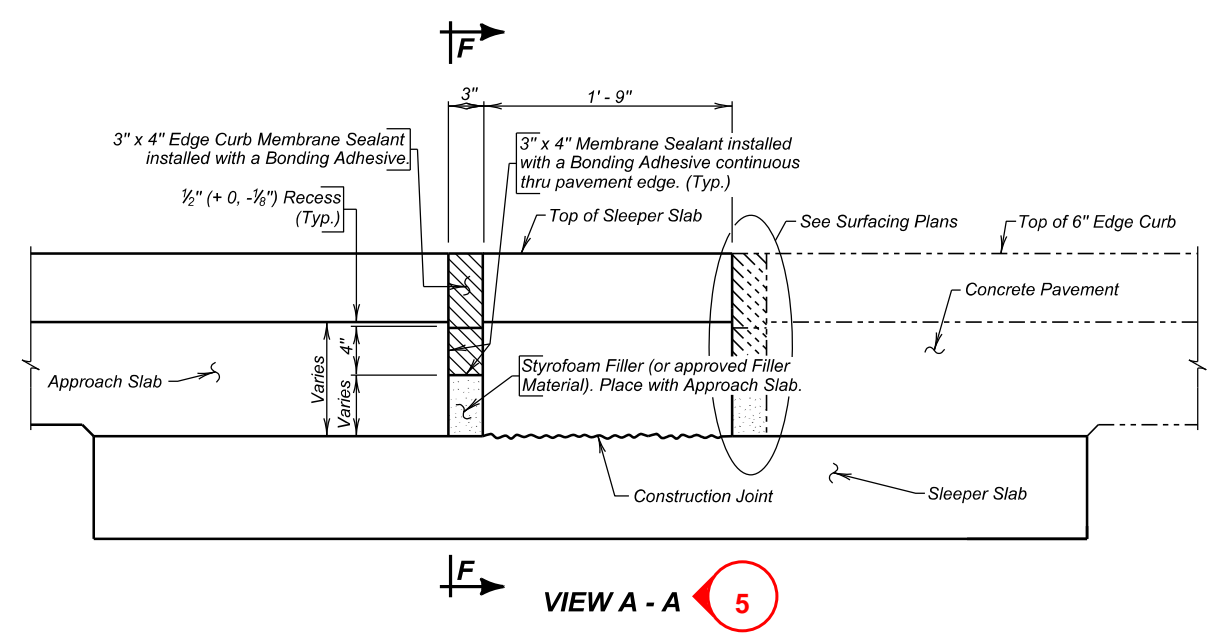
Project Block

3

Plan View as Required

4

Notes as Required



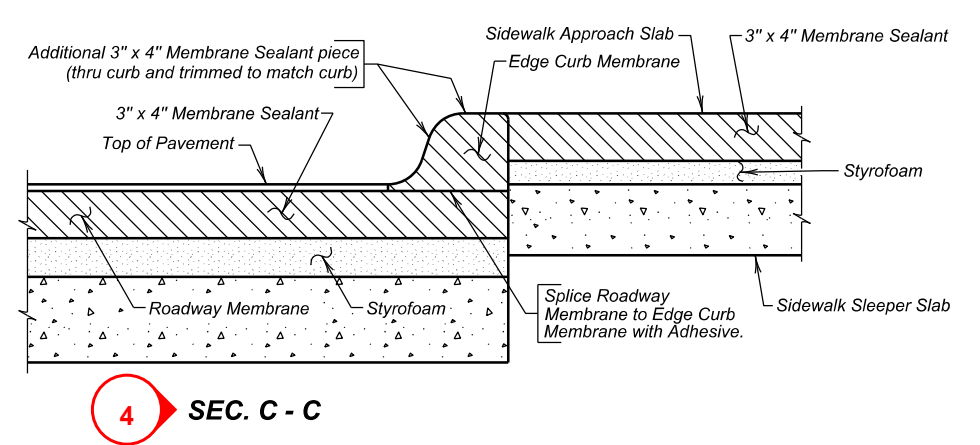
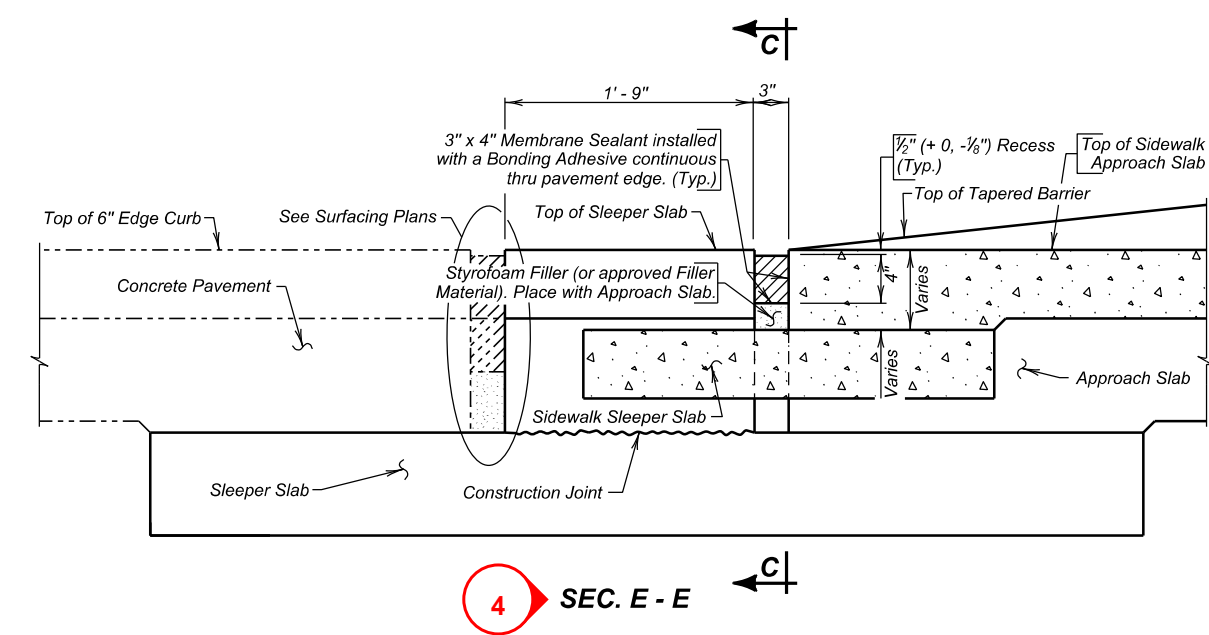
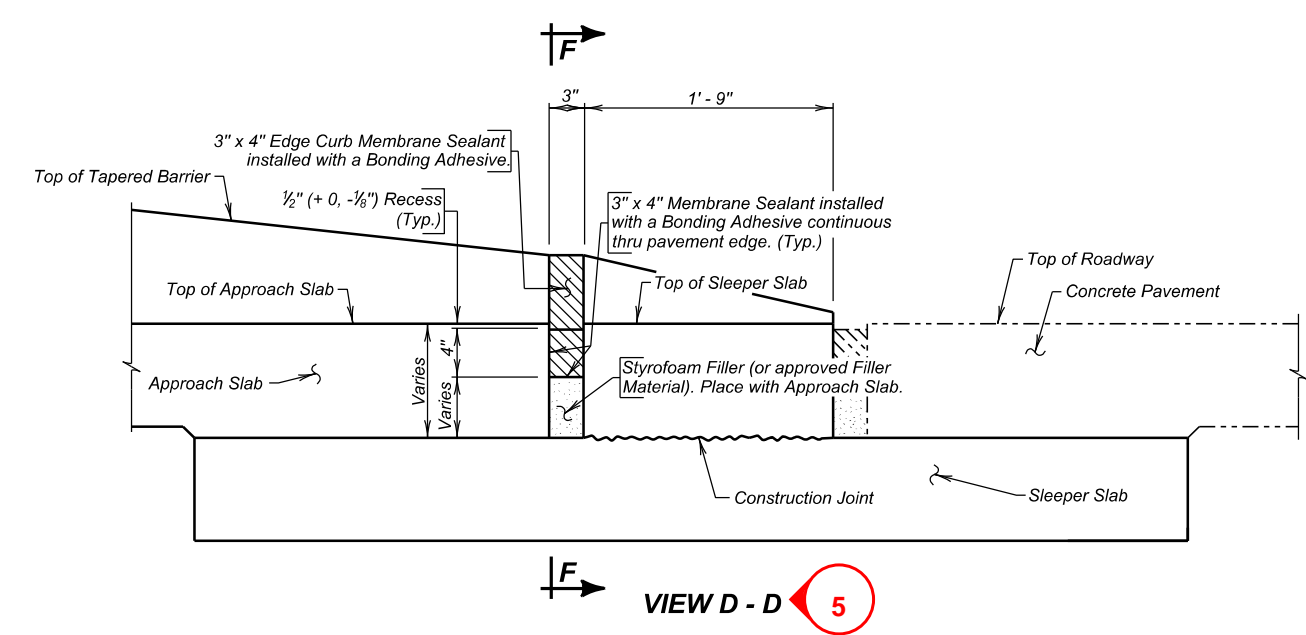
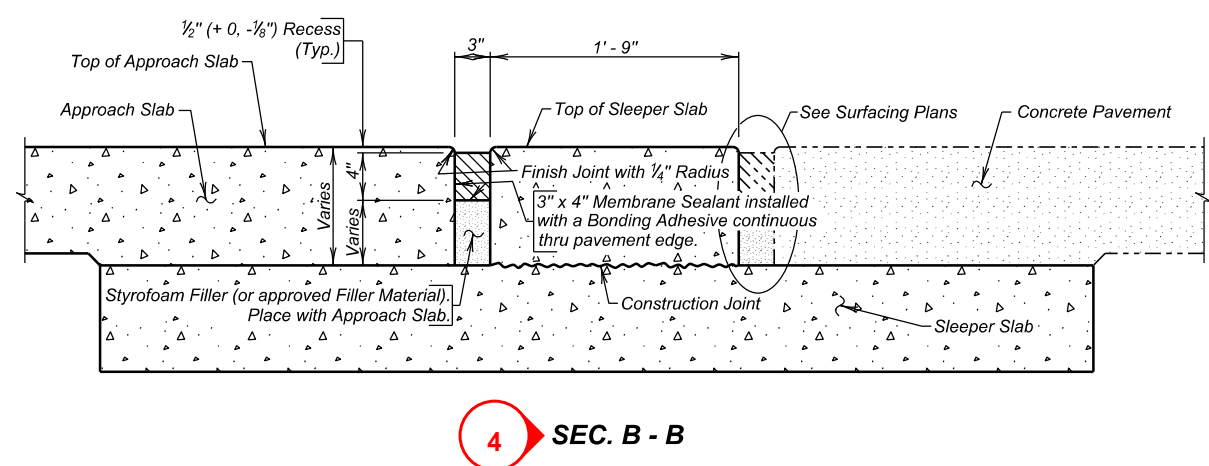
- REQUIRED LIST
- 1 Title Block

2 Project Block

3 Estimated Quantities

4 Sections as Required

5 Views as Required



3

ESTIMATED QUANTITIES		
(For Two Approach Slabs)		
ITEM	UNIT	QUANTITY
Membrane Sealant Expansion Joint	Ft.	104.0

1

APPROACH SLAB JOINT DETAILS (B)

FOR

430' - 10 5/8" PRESTR. GIRDER BRIDGE

42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW

OVER BIG SIOUX RIVER SEC. 9-T104N-R49W

STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104

STR. NO. 50-206-020 HL-93

MINNEHAHA COUNTY

S. D. DEPT. OF TRANSPORTATION

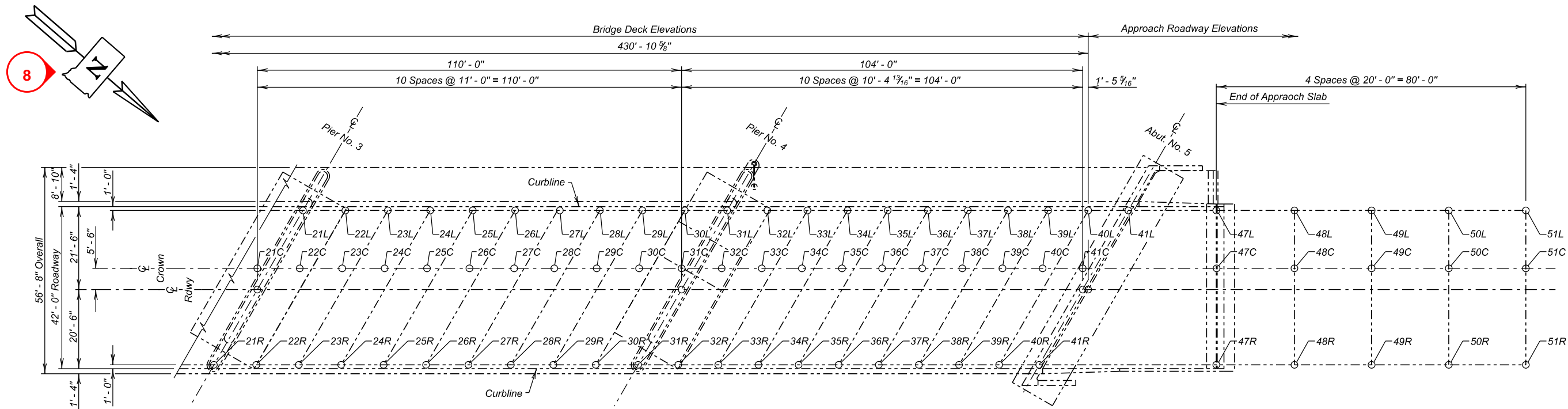
APRIL 2016

46 OF 50

DESIGNED BY	CK. DES. BY	DRAFTED BY	BRIDGE ENGINEER
TD	BB	BT	Steve A. Johnson

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			



4 PLAN

Table of As-Built Elevations - Bridge Deck					
Location	Elevation	Location	Elevation	Location	Elevation
21L		21C		21R	
22L		22C		22R	
23L		23C		23R	
24L		24C		24R	
25L		25C		25R	
26L		26C		26R	
27L		27C		27R	
28L		28C		28R	
29L		29C		29R	
30L		30C		30R	
31L		31C		31R	
32L		32C		32R	
33L		33C		33R	
34L		34C		34R	
35L		35C		35R	
36L		36C		36R	
37L		37C		37R	
38L		38C		38R	
39L		39C		39R	
40L		40C		40R	
41L		41C		41R	

Table of As-Built Elevations - Approach Roadway					
Location	Elevation	Location	Elevation	Location	Elevation
47L		47C		47R	
48L		48C		48R	
49L		49C		49R	
50L		50C		50R	
51L		51C		51R	

Elevations - Bridge Survey Markers		
Location	Station - Offset	Elevation
End Bridge		

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
Bridge Elevation Survey	L. S.	Lump Sum

- REQUIRED LIST
- ① Title Block

② Project Block

③ Survey Datum Box

④ Plan View

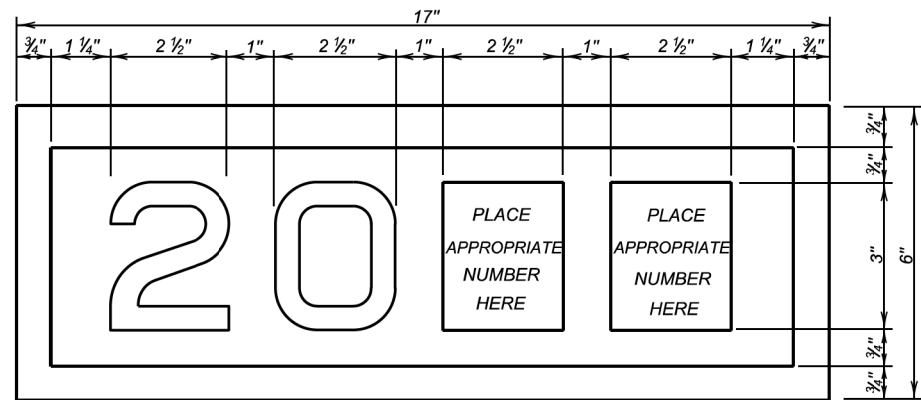
⑤ Estimated Quantities

⑥ Table for Shot Elevations

⑦ Bridge Survey Marker Table

⑧ North Arrow

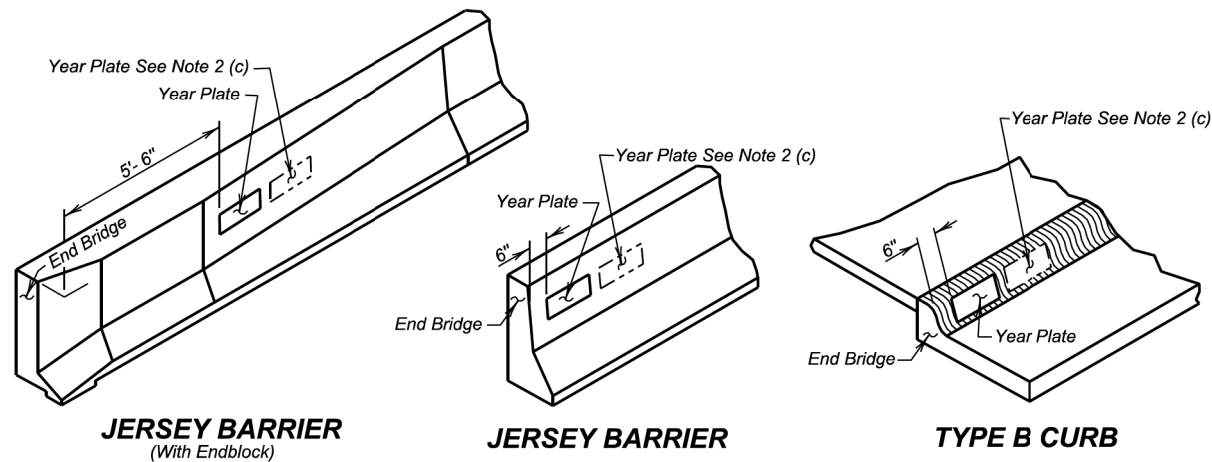
1 AS - BUILT ELEVATION SURVEY (B)
FOR
430' - 10 5/8" PRESTR. GIRDER BRIDGE
42' - 0" ROADWAY & 8' - 0" SIDEWALK 30° LHF SKEW
OVER BIG SIOUX RIVER SEC. 9-T104N-R49W
STA. 123 + 18.74 TO 127 + 49.63 P 0115(51)104
STR. NO. 50-206-020 HL-93



YEAR PLATE DETAILS

GENERAL NOTES:

- Year plates of the general dimensions shown shall be constructed on all box culverts and bridges. The year plates shall be constructed in reverse and attached to the forms in such a manner that the finished imprint in the concrete does not exceed one-half (1/2) inch in depth.
- Year plates shall be located on structure (s) as follows:
 - On cast-in-place box culverts the year plates shall be four and one-half (4 1/2) inches below the top of the upstream parapet wall and centered laterally on the upstream face. On precast box culverts the year plate shall be centered laterally on the upstream face of the top slab. Where an extended interior wall interferes with this location, the year plate shall be centered in an adjacent barrel.
 - On bridges with six (6) inch curbs or "Jersey" shaped barriers with no endblocks, the year plate shall be centered vertically on the curb face approximately six (6) inches from the end of the bridge, or as designated by the Engineer. On bridges with "Jersey" shaped barrier endblocks, the year plate shall be centered on the upper sloped portion of the barrier approximately 5'-6" from the end of the bridge, or as designated by the Engineer. There shall be one year plate at each end of the bridge on opposite sides.
 - When the plans specify that both the original date of construction and the date of reconstruction are to be shown, one date shall be placed as listed above and the other located adjacent to it. Both year plates shall be shown at each end of the bridge on opposite sides.
- There will be no separate measurement or payment made for year plates on box culverts and bridges. All costs for this work shall be incidental to other contract items.



JERSEY BARRIER
(With Endblock)

JERSEY BARRIER

TYPE B CURB

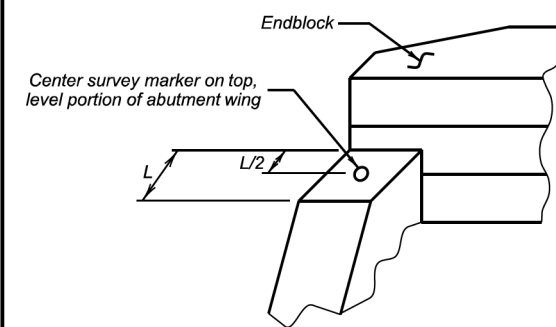
June 26, 2012

Published Date: 1st Qtr. 2019	S D D O T	YEAR PLATE DETAILS	PLATE NUMBER
			460.02
			Sheet 1 Of 1

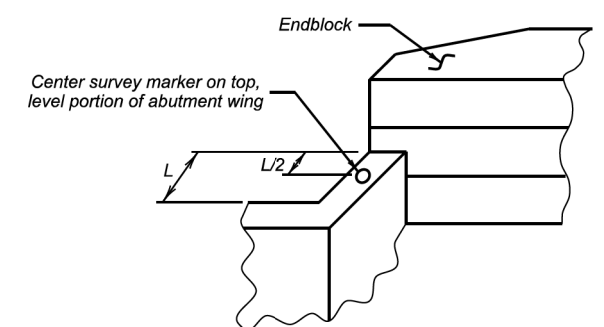
REQUIRED LIST

- 1 Title Block
- 2 Project Block
- 3 Insert Required Standard Plate Sheets as Needed

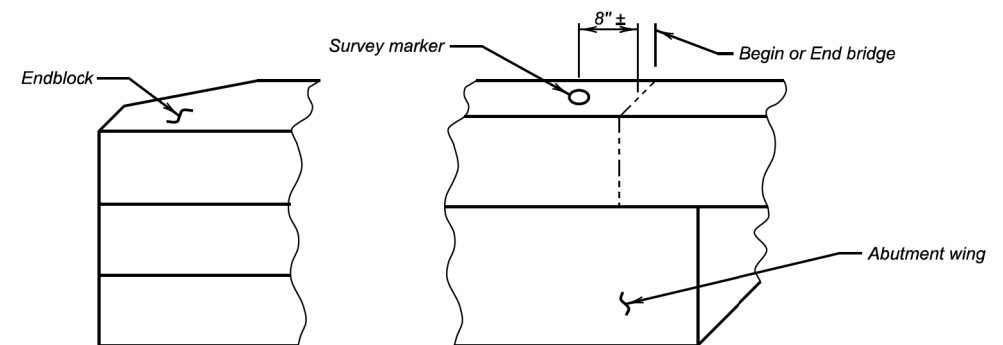
STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			



ABUTMENT WITH
"STRAIGHT" WINGS



ABUTMENT WITH
"SWEEP BACK" WINGS



ABUTMENT WITH
"SWEEP BACK" WINGS
(Endblock on top of wings)

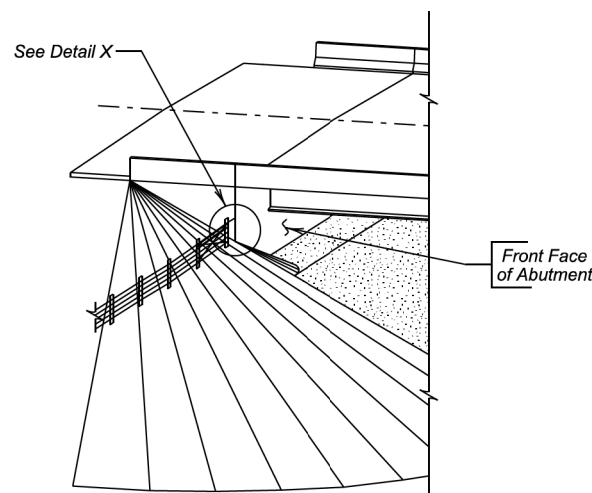
GENERAL NOTES:

- Survey markers shall be located at each abutment on the same side of the bridge as the year plate. Place survey markers on abutment wings as shown. Two survey markers will be required at each bridge.
- Survey markers shall be of a type intended for installation in concrete, be made of solid brass or bronze, have a domed top and be either a 3" top diameter (with a 3/4" X 2" long ribbed shank), or a US Army Corps of Engineers Type C Disc with a 3 1/2" top diameter.
- There will be no separate measurement or payment made for survey markers. All costs for this work shall be incidental to the other contract items.

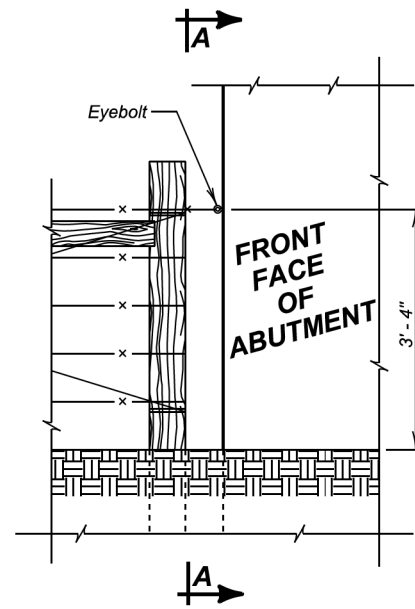
June 26, 2012

Published Date: 1st Qtr. 2019	S D D O T	BRIDGE SURVEY MARKER	PLATE NUMBER
			460.05
			Sheet 1 of 1

STATE OF	PROJECT	SHEET NO.	TOTAL SHEETS
S.D.			



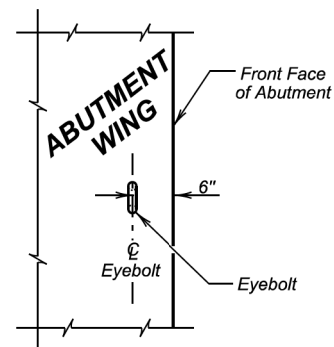
DETAILS FOR FENCE ANCHORS



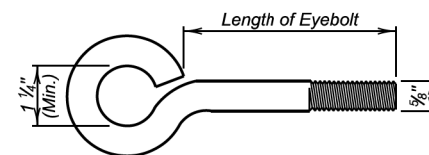
DETAIL "X"

GENERAL NOTES:

- The fence and post details shown are for illustrative purpose only. The fence shall be as specified elsewhere in the plans.
- Eyebolts shall be placed on all of the bridge abutment wings.
- Eyebolts shall be $\frac{5}{8}$ inch diameter and shall conform to ASTM A307.
- Eyebolts shall be galvanized in accordance with AASHTO M232 (ASTM A153).
- Eyebolts shall be installed after abutment wings are backfilled and berm construction is complete. Drill-in and epoxy eyebolts into abutment such that the eye of the bolt is flush with the concrete surface.
- The epoxy resin mixture shall be of a type for bonding steel to hardened concrete and shall conform to AASHTO M235 Type IV, Grade 3 (Equivalent to ASTM C881, Type IV, Grade 3).
- The diameter of the drilled holes shall not be less than $\frac{1}{8}$ inch greater, nor more than $\frac{3}{8}$ inch greater than the diameter of the eyebolts or as per Manufacturer's recommendations. The drilled holes shall be blown out with compressed air using a device that will reach the back of the hole to be sure that all debris or loose material has been removed prior to epoxy injection.
- Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes $\frac{1}{2}$ to $\frac{3}{4}$ full of epoxy, or as recommended by the Manufacturer, prior to insertion of the eyebolts. Care shall be taken to prevent epoxy from flowing out of the horizontal holes prior to eyebolt insertion. Rotate the eyebolt during installation to eliminate voids and ensure complete bonding of the bolt. Insertion of the eyebolts by the dipping or painting method will not be allowed.
- Loads shall not be applied to the epoxy grouted eyebolts until the epoxy resin has had sufficient time to cure as specified by the epoxy resin manufacturer.
- The cost for furnishing and installing the eyebolts shall be incidental to various contract items.



VIEW A - A



EYEBOLT DETAILS

REQUIRED LIST

- ① Title Block
- ② Project Block
- ③ Insert Required Standard Plate Sheets as Needed

December 23, 2012

Published Date: 1st Qtr. 2019

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**FENCE ANCHORS FOR BRIDGE ABUTMENTS
(SWEEP BACK WINGS)**

PLATE NUMBER
620.19

Sheet 1 of 1